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ANDREAS VESALIUS

The portrait of Andreas Vesalius which Dr. Harvey Cushing bequeathed to the Historical Library at Yale. Closely similar is the Vesalins portrait at the Louvre which is attributed to Jan van Calcar, as is the Cushing portrait. It has not been ascertained which is the original. Obtained (from Ryman's, Oxford) in January, 1920.

THE 400th ANNIVERSARY
OF
ANDREAS VESALIUS

Publication No. 7

HISTORICAL LIBRARY
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1. The Harvey Cushing Collection of Books and Manuscripts, 1943
2. The Arnold C. Klebs Collection of Books and Manuscripts
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3. The John F. Fulton Collection of Books and Manuscripts
(*In Preparation*)
4. *Bibliographia primatologica*. A Classified Bibliography of Primates other than Man By T. C. RUCH, 1941
5. A Bibliography of Aviation Medicine
By E. C. HOFF and J. F. FULTON, 1942
6. A Bio-bibliography of Andreas Vesalius
By HARVEY CUSHING, 1943

THE FOUR HUNDREDTH ANNIVERSARY
CELEBRATION
OF THE
DE HUMANI CORPORIS FABRICA
OF
ANDREAS VESALIUS

The Historical Library
Yale University School of Medicine
1943

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CELEBRATION OF THE
FOUR HUNDREDTH ANNIVERSARY
OF THE
DE HUMANI CORPORIS FABRICA
OF ANDREAS VESALIUS

The Historical Library,
Yale University School of Medicine,
30 October, 1943*

Program

Presiding: William W. Francis, *Librarian of the Osler
Library, McGill University*

Introduction

John F. Fulton, *Professor of Physiology, Yale University
School of Medicine*

The Place of Vesalius in the Culture of the Renaissance

Ernst A. Cassirer, *Visiting Professor of Philosophy, Yale
University*

Vesalius at the University of Paris

Edward C. Streeter, *Curator of Museum Collections, His-
torical Library, Yale University School of Medicine*

Oporinus and the Publication of the *Fabrica*

Carl P. Rollins, *Printer to Yale University*

The Attack of Puteus on Vesalius and the Defence by Cuneus

Arturo Castiglioni, *Research Associate in the History of
Medicine, Yale University School of Medicine*

Benediction

The Reverend George Stewart

* A selection of books and memorabilia from Dr. Harvey Cushing's rich collection of Vesaliana was on display in the Rotunda of the Medical Library.

Seated in academical costume on the platform were: Dr. William W. Francis, Prof. Ernst A. Cassirer, Prof. A. Castiglioni, Mr. Carl P. Rollins, Dr. Edward C. Streeter, Dr. C. N. H. Long, Mr. Carl A. Lohmann, Dr. George Stewart, Dr. John F. Fulton, Capt. Louis H. Roddis, (MC) U.S.N., and Lt. Col. Carlos G. de Gutiérrez-Mahoney, A.A.F., M.C.

INTRODUCTION

JOHN F. FULTON



IN TAKING TIME off to-day to commemorate one of the greatest mile-stones in our medical annals, we do so, not only in recognition of the achievements of Andreas Vesalius as anatomist and military surgeon but also in recognition of the fact that as a University in a free country we are still at liberty to maintain our academic traditions and observances. In these times it is therefore both fitting and a privilege to be able to welcome two distinguished members of our Armed Forces: Colonel Carlos Guillermo de Gutiérrez-Mahoney, one of Dr. Cushing's youngest pupils, now ranking neurosurgeon of the Army Air Forces; and Captain Louis H. Roddis, the friendly biographer of William Withering and the official medical historian of our Navy.

It is likewise a source of gratification that to-day on our program we are able to secure the distinguished philosopher of Germany, Professor Cassirer, as well as Professor Castiglioni of Italy who occupied a similar position in that country as its foremost medical historian. We are fighting to make possible occasions such as this, as well as to foster among our students careers of men, like Andreas Vesalius, who in the face of bigotry and prejudice have had the courage freely to speak their minds.

We turn now to the more immediate program of our meeting. When writing home from Baltimore in 1898, while acting as a resident in surgery, Harvey Cushing mentioned that he had just met Dr. Osler, the dynamic Professor of Medicine. Sometime thereafter there was a Vesalius meeting at the Hopkins Medical History Club.* This was all that Dr. Cushing required. He had discovered his man, for in Vesalius he found irresistible fascination—an artist with an incredible capacity for work; Vesalius also had youth, zeal, and a stormy temperament not unlike his own. During the next forty years Cushing pursued his trail, collecting everything conceivable relating to the man and his work. Before us lies one of his earliest

* Futcher, T.: Association between famous artists and anatomists. Read October 17, 1905. Bull. Johns Hopkins Hosp., 1906, 17, 38-39.

acquisitions, a superb copy of the 1543 *Fabrica* which had been given him by Osler in 1903; and bridging the span of these 400 years, you can also see the proof sheets of Dr. Cushing's final piece of writing—*A Bio-bibliography of Vesalius* which will bear the date 1943. During the early years of Dr. Cushing's collecting William Osler was constantly in the background, sending notes, cuttings from booksellers' catalogues, and, often as not, Osler bought for H. C. an expensive item when he was aware that the exchequer of the young surgeon would have precluded acquisition.

In a very real sense, therefore, Yale owes its great Vesalian collection to the influence which William Osler exerted upon Cushing and upon others whom he had inspired, and we therefore feel particularly fortunate that Sir William's nephew, Dr. William Wilmoughby Francis, the distinguished librarian of the Osler Library at McGill University, can be here to preside at our ceremony.

DR. FRANCIS: It is the 400th birthyear of the beautiful book which graces the lectern in front of me, the most artistic book and one of the most illuminating in the history of medicine. As Osler remarked, 1543 is a starred year in the history of science. In it appeared the two great works which inaugurated modern science, Copernicus' *Revolutions of the heavenly bodies*, which gave us a rational and abiding explanation of the workings of the macrocosm, the great universe, and Vesalius' *Fabrica*, which for the first time fully, and for the first time accurately, portrayed not only the structure but to some extent also the workings of the body of man, that mysterious spiritual animal which the Middle Ages called the microcosm or little universe.

We are here to do honor to Vesalius, who being dead these many years yet speaketh, but there are other spirits who, in memory, are brought close today. Those who have known and loved Harvey Cushing cannot help feeling that here in this beautiful room which nobly enshrines his books and his memory we have come together to pay our affectionate respects to him no less than to honor his favorite hero.

In a special sense Harvey Cushing still lives in his pupils, and in one of them in particular. He, not I, should

be presiding here today, for to the piety—in the old Roman sense—and to the well-known driving force of John Fulton we owe this celebration, and also the imminent completion of Harvey Cushing's great work on Vesalius and the catalogue of his magnificent historical collection. A terrific field of force surrounds that fellow Fulton, locally and aptly known as the Dynamo, and it extends for hundreds of miles in the direction, at least, of Montreal. He is responsible for my name being honored on this program—and in all its *Will*-ful fullness, including the second element which for more than sixty sensitive years I've been trying to suppress.

Having the luck to be librarian of Osler's collection, I cannot refrain from remarking that this is the tercentenary year of his favorite book, his "life-long mentor," at least of the authorized edition, 1643, on whose title-page Sir Thomas Browne put, "A true and full copy of that which was most imperfectly and Surreptitiously printed before under the name of *Religio Medici*." In contrast, the year 1743 was pretty barren. About the only thing I could find worth mentioning was that somebody writing on what was then called the epidemic catarrh rechristened it *influxus*, whence our Spanish influenza or English 'flu. The 18th century was dull anyway, so I pass on gladly to 1843. A recent essay of Dr. Henry Viets reminds us that 100 years ago Oliver Wendell Holmes contributed his red-hot life-saving tirade, "The Contagiousness of Puerperal Fever," one of the great glories of American medicine.

Prof. Ernst Cassirer, whose coming to Yale some two years ago was a bit of singular good fortune even for this well-favored University, was formerly Professor of Philosophy at Hamburg and at Stockholm, and had previously taught at Oxford. World-famous in his subject in general he is in particular the authority on Kant. This is an achievement which inspires awe and reverence, especially in any one inclined (like me) to spell the name of the critic of pure reason with an initial C and apostrophe t!

I have the honor to call upon Prof. Cassirer.

THE PLACE OF VESALIUS IN THE CULTURE OF THE RENAISSANCE

ERNST A. CASSIRER



MUST BEGIN with expressing my cordial thanks for your kind invitation. It is a great pleasure to me and I regard it as a great privilege to be asked to participate in this celebration of the four-hundredth anniversary of Vesalius' *De humani corporis fabrica*. But I have to confess that I felt serious scruples about my competence for the task you have assigned to me.

Is a philosopher entitled to speak about Vesalius' work, the work of a great physician and a great anatomist?

Like Galileo, Vesalius was engaged in a continuous struggle against philosophical authorities. He denied and defied the scholastic tradition. His work seems to be entirely original. "*Immortale opus*," said Albrecht von Haller, the great physiologist, in speaking of *De humani corporis fabrica*, "*et quo priora omnia quae ante se scripta fuissent paene reddidit superflua*"—an immortal work which made superfluous almost all that had been written before.

Nevertheless, there are no isolated facts and no isolated figures in the history of human thought. Even Vesalius does not stand alone. He is a typical example and a classical witness to the spirit of the Renaissance. But what does Renaissance mean? There are scholars—and scholars of high authority in their special fields—that have warned us against the use of the very term Renaissance. Many of them flatly deny that there ever was such a thing as a renaissance in European culture. "What is the use in questioning the Renaissance?" wrote Lynn Thorndike in one of the last issues of the *Journal of the History of Ideas*. "No one has ever proved its existence, no one has really tried to." But we must not dispute about words. Recent research—made by men like Pierre Duhem, George Sarton, Lynn Thorndike—has shown us that there are innumerable threads which connect the scientific work of the Quattrocento and Cinquecento with medieval science—with that science that was taught at the universities of the Middle Ages. But that the work of Vesalius or Galileo was an immense progress and has a

claim to a real and fundamental originality seems to me to be undeniable. Galileo was perfectly right to speak of his Dynamics as a "new science." Galileo's science of motion was not only new in its answers but also in its mode of questioning and investigating. By this new method of investigation that we find in Galileo's and Vesalius' work there were not only discovered new facts; the whole intellectual structure of science and philosophy underwent a profound change.

To understand the character of this intellectual process we must begin with an analysis of medieval thought. The medieval thinkers were divided into various schools. Between these schools—between the realists and nominalists—there were interminable discussions. Nevertheless, there was a deep unity in medieval philosophy and medieval culture. There was a common center of thought that remained firm and unchangeable for many centuries. To grasp this unity of medieval thought there is perhaps no better and easier way than to study the two books *Περὶ τῆς οὐρανίας ἱεραρχίας* and *Περὶ τῆς ἐκκλησιαστικῆς ἱεραρχίας* ("On the celestial hierarchy" and "On the ecclesiastical hierarchy"). The author of these books is unknown. In the Middle Ages they were generally attributed to Dionysius Areopagita, the disciple of St. Paul, who was converted and baptized by him. But this is only a legend. The books were probably written by a neo-Platonic writer, a disciple of Proclus. They presuppose the theory of emanation that had been developed by Plotinus, the founder of the neo-Platonic school. In order to understand a thing we must—according to this theory—always go back to its first principle and we must show in what way it has evolved from this principle. The first principle, the cause and origin of all things is the One, the Absolute. This absolute One develops into the multiplicity of things. But that is not a process of evolution in our modern sense, it is rather a process of degradation. The whole world is held together by a golden chain—that *aurea catena* of which Homer spoke in a famous passage of his *Iliad*. All things whatsoever—spiritual and material things—the archangels, the angels, the Seraphim and Cherubim and all the other celestial legions, man, organic nature, matter—all of them are bound in this golden chain about the feet of God. There are two different hierarchies; the hierarchy of existence and that of value. But they are not opposed to each other; they correspond to each other and are in perfect harmony. The degree of value depends on the degree of being. What

is lower in the scale of existence is also lower in the ethical scale. The more a thing is remote from the first principle, from the source of all things, so much the less is its grade of perfection.

The pseudo-Dionysian books about the celestial and ecclesiastic hierarchies were widely and eagerly studied throughout the Middle Ages. They became one of the principal sources of scholastic philosophy. The system developed in these books influenced not only the thoughts of men; it was connected with their deepest feelings and it was expressed, in different ways, in the whole ethical, religious, and social order. Also the physical, the cosmological order, was conceived according to the principles of this system. In Aristotelian cosmology God is described as the "unmoved mover" of the universe. He is the ultimate source of motion—being at rest himself. He transmits his moving force first to the things that are next to him: to the highest celestial spheres. From here this force descends, by different degrees, to our own world, to the earth, the sublunar world, the world below the moon. But here we no longer find the same perfection. The higher world, the world of the celestial bodies, is made of an imperishable and incorruptible substance—the Ether or the *quinta essentia*, and the movements of these bodies are eternal. In our world everything is perishable and liable to decay; and every movement comes, after a short time, to its standstill. There is a sharp discrimination between the lower and the higher worlds; they do not consist of the same substance and they do not follow the same laws of motion. The same principle holds for the structure of the political and social world. In religious life we find the ecclesiastical hierarchy that reaches from the Pope, as the summit, to the cardinals, the archbishops, the bishops down to the lower degrees of the clergy. In the state the highest power is concentrated in the Emperor, who delegates this power to his inferiors, the princes, the dukes, and all the other vassals. This feudal system is an exact image and counterpart of the general hierarchical system; it is an expression and a symbol of that universal cosmic order that has been established by God and which, therefore, is eternal and immutable.

This system has prevailed throughout the Middle Ages and proved its force in all spheres of human life. But in the first centuries of the Renaissance, in the Quattrocento and Cinquecento, it changes its form. This change does not come all of a sudden. We do not find a complete breakdown, an abrogation or an open denial of

the fundamental principles of medieval thought. Nevertheless, one breach after another is made in the hierarchical system that seemed to be so firmly established and that had governed the thoughts and feelings of men for many centuries. The system is not destroyed; but it begins to fade away, it begins to lose its unquestioned authority. The Aristotelian cosmologic system is replaced by the astronomical system of Copernicus. In the latter we find no longer a distinction between the "higher" and the "lower" world. All movements whatever—the movements of the earth and those of the celestial bodies—obey the same universal rules. According to Giordano Bruno, who was the first thinker to give a metaphysical interpretation of the Copernican system, the world is an infinite whole, pervaded and animated by the same infinite divine spirit. There are no privileged points in the universe, no "Above" or "Below." In the political sphere the feudal order is dissolved and begins to crumble. In Italy we find new political bodies of a quite different type. We find the Renaissance tyrannies, created by individual men, the great *condottieri* of the Renaissance, or by great families, the Visconti or Sforzas in Milan, the Medici in Florence, the Gonzagas in Mantua. In religious life the former ecclesiastical order is shaken to its very foundation by the work of the reformation. There is no longer any gradation in the spiritual and religious world; everyone becomes his own priest.

But after this long introduction I must be quite prepared for a certain impatience on the part of my audience. All these general phenomena—you will perhaps aver—may be very interesting, but what have they to do with the present question, with the celebration of the four-hundredth anniversary of the publication of *De humani corporis fabrica* by Andreas Vesalius? How can such generalities as the dissolution of the hierarchical system affect the work of an anatomist? I admit that this seems to be a very plausible argument. But on the other hand, we must not forget that in the intellectual world, in the world of scientific and philosophical ideas, all things hang together. Practically speaking we must introduce a division of labor; we must separate the various branches of knowledge and specialize in certain fields. But we must not allow ourselves to be deceived by these specializations. The *globus intellectualis* is a coherent whole. What happens in one sphere always affects, to a greater or less degree, all the other spheres. That holds also for the work of Vesalius. At first sight it seems to be restricted to a

special field. Vesalius never indulges in general metaphysical speculations. In his work we do not meet with abstract theories, but with observations and experiments. Nevertheless, I hope to convince you that Vesalius' work had not only a particular but a universal merit; not only a scientific but also a philosophic interest.

What was the place of science in the medieval system? Even in the organization of scientific thought we find the same fundamental principle. There is a hierarchy of knowledge in the same sense as there is an ecclesiastical or political hierarchy. The highest knowledge is that branch of knowledge that deals with the highest object. This highest object is God. The superiority of theology, its reign over all the other sciences—mathematics, physics, natural history—is, therefore, clear and incontestable. The different sciences are invested with their truth in the same way in which, in the feudal system, the vassals were invested with their lands by the supreme power of the Emperor. We get a clear insight into this hierarchical system of science when studying the work of a great scholastic thinker of the thirteenth century: the work of Bonaventura, *Reductio artium ad theologiam*. Bonaventura tries to assign to every branch of knowledge its special place and to confer upon it its special dignity. It is the distance from the common center—the distance from theology—that determines this dignity; that gives to every special science its rank in the general order. But if we accept this system, what becomes of the art of medicine? To be sure medicine was held in the highest esteem during the Middle Ages. It had its place in all the medieval universities. The works of Galen and of the great Arabian and Jewish physicians were studied with the greatest interest. Also in the social order the physician had a very high rank. Nevertheless, there remained a difficult question. According to the general principle of medieval thought—the principle of the correspondence of the scale of being and the scale of value—medicine must, after all, content itself with a lower rank; it cannot hope to ascend to the highest dignity. For it is a science of the body. The first Fathers of the Church had spoken of the body in a very contemptuous way; they hated and despised the body. In the later systems—especially in the system of Thomas Aquinas—we no longer find the same contempt. The natural world is no longer in strict opposition to the spiritual world, the world of Grace; it has a value of its own. *Gratia*, said Thomas Aquinas, *naturam non tollit, sed perficit*—Grace does not destroy nature; it perfects nature.

Nevertheless, there could be no doubt that in the general order of things spiritual things are always superior to material things. If the value of a science depends upon its subject the science of the body can never claim the same value and perfection as those sciences which deal with spiritual subjects. Even in the Renaissance this view was still generally admitted. To illustrate this by a special example I refer to the book of Coluccio Salutati, *De nobilitate legum et medicinae*. In this book Salutati, a famous Renaissance writer, asks the question whether the art of jurisprudence or the art of medicine is the higher and nobler one. According to him the answer to this question is clear. *Nos curamus temporalia*, says the art of medicine in Salutati's book, *sed leges aeterna; ego de terra creatus sum, lex vero de mente divina*,—Medicine has to do with temporal things, Jurisprudence with justice, which is an eternal thing; Medicine has its root in the earth, Law originates in heaven.

The problem becomes even more difficult and precarious if from medicine in general we pass to anatomy. For the subject-matter of anatomy is not the living body, but the dead body. And in the hierarchy of existence the dead body is the lowest of the low. Such views were by no means rare in the age of the Renaissance. The Renaissance was the period of classical humanism; and humanistic culture was prone to disdain the study of the human body. We have a characteristic anecdote to illustrate this point. When engaged in his anatomical work Vesalius once was visited by a friend. This friend, a scholar and humanist, was shocked and scandalized. How could a man of high education and refined taste, he asked him, ever condescend to do such a dirty and hideous work as to dissect human corpses? To become the founder of scientific anatomy, Vesalius had not only to struggle with technical but also with all sorts of moral difficulties. He had to do many things that seemed to be very hazardous and objectionable. A well-known story tells us how Vesalius once got up in the night, in order to steal in the darkness the corpses of two hanged robbers from the gallows and later smuggled them stealthily into the house of a friend. Such were the conditions under which Vesalius had to live and work. All of this needed not only great intellectual, but also great moral powers; not only an ardent desire to know but also great will-power, an undaunted courage. Anatomy had a new flowering season in the period of the Renaissance. Not only the scientists or physicians of

the Renaissance but also the great artists, the painters and sculptors, had a keen interest in anatomical problems. But theoretically and philosophically anatomy had not yet found its place in the sun—in the totality of man's intellectual culture.

From the point of view of the general history of ideas it is very interesting and highly attractive to trace the slow processes of thought by which this intellectual crisis was finally overcome. The first vigorous attack was made by that powerful genius whose name we find everywhere among the pioneers of modern culture. We may study a scientific problem, a problem of statics or dynamics, or a problem of natural history, of anatomy or physiology, we may study the history of painting, sculpture, architecture, we always meet with Leonardo da Vinci. In Leonardo da Vinci's manuscripts the first step was made to destroy the traditional hierarchy of sciences. This hierarchy was based on the principle that the rank and dignity of a science depend upon its subject-matter. Leonardo da Vinci refuses to accept this principle. With what subject a science is concerned is quite irrelevant. What we look for in science is truth, and truth may be found in the lowest thing just as much as in the highest. What do we know with absolute certainty of these highest things—the archangels, the angels, the whole celestial hierarchy? What theology or metaphysics tell us about these things is very doubtful, and in many cases it is obviously wrong. We must therefore change our whole standard of value. We must seek for a firm, indubitable, and unshakable knowledge, not for a knowledge of the greatest and most sublime things. "To lie is so vile," says Leonardo, "that even if it were in speaking well of godly things, it would take off something of God's grace, and Truth is so excellent that if it praises but small things, they become noble. Truth is so excellent that even if it dwells on humble and lowly matters, it is still infinitely above uncertainty and lies disguised in high and lofty discourses. But you who live in dreams are better pleased with the sophistical reasons and frauds of wits in great and uncertain things than with those reasons which are certain and natural and not so far above us." The same thought is expressed, in the most concise and striking way, in a short epigram of Leonardo da Vinci. *Meglio è la piccola certezza che la gran bugia*,—a small truth is better than a great lie.

By this dictum of Leonardo's the spell was broken. It became the magic word—the key-word that unlocked the doors of understanding

to a new conception of the meaning and value of science. At first sight, the remarks of Leonardo may seem to be very simple and even obvious. But simplicity is always the distinctive mark of a true genius: *simplex sigillum veri*. It was, however, the tragic fate of Leonardo that most of his deepest thoughts could exert no immediate influence. They were buried, for many centuries, in his manuscripts. The great scientists of the sixteenth and seventeenth centuries had to rediscover the same principle that, a long time before, had been so clearly expressed by Leonardo. Galileo emphasizes, time and again, that it is more estimable to find out the truth, even in an insignificant detail, than to speculate extensively on the highest problems without a positive and definite result. The relation between Vesalius' *Fabrica* and the anatomical studies of Leonardo seems still to be a controversial problem. Many scholars have gone so far as to charge Vesalius with a plagiarism of Leonardo's manuscripts. The arguments proposed for supporting this charge were sometimes very strange. One of the strangest arguments was to say that it seems highly improbable that such a perfect work as the *Fabrica* was written by a young man of twenty-eight years. But that same young man had attended plague cases and practised surgery as a boy of fifteen years. When arguing in this way we wrong not only Vesalius but also his whole age, the age of the Renaissance. The Renaissance produced more of these miracles. The first writings and the first scientific discoveries of Galileo show us a very mature and precocious mind. Vesalius may have known, he must, indeed, have known many of Leonardo's results. It is for the history of medicine to decide how much he owed to these results. What seems to me to be sure is that, in a methodological or philosophical sense, his work has a real claim to originality. Vesalius' *Fabrica* became the fulfilment of what had been demanded by Leonardo. As Leonardo had pointed out, the value of a science does not depend upon its subject-matter, but upon the degree of certainty of which it is capable. By Vesalius' work anatomy was raised to a degree of certainty that it never had before. In the Middle Ages and in the Quattrocento and Cinquecento anatomy was still closely connected with all sorts of mythical speculations. Many of the famous physicians of the Middle Ages and the Renaissance were at the same time famous astrologers. In their study of the human body they started from the principle that the human body is a *parvus mundus*, a microcosm, and that the true nature of this microcosm

can only be recognized by comparing it to the macrocosm, the great world. By virtue of this principle the human body became an exact counterpart of the cosmic order. The heart was regarded as the sun, the other organs, the lung, the liver, were correlated with the planets. When studying the manuscripts of Leonardo da Vinci we still find many striking examples of this strange astrological anatomy. All this was completely obliterated in the work of Vesalius. Anatomy was recognized in its true character; it became a pure empirical science second to none. By this step anatomy overcame its intellectual crisis. Its value could no longer be called in question; it had at last found its firm place in the *globus intellectualis*.

All this had a strong influence not only upon the further development of medical thought but also upon the development of philosophical thought. Unfortunately this point has been unduly neglected by the historians of modern philosophy. The name of Vesalius does not appear in our text-books of the history of philosophy. It would, however, be a very appealing task to study the influence which Vesalius' work exercised on the first founders of modern philosophy. Here, at the end of this address, I cannot enter into this question. Nevertheless, I cannot refrain from giving at least a few hints. Descartes was a great admirer of Vesalius. He was deeply interested in anatomical problems; and he made a regular practice of dissecting animals, the bodies of which he had himself procured from his butcher. During his sojourn in Holland Descartes once had a visit from a French gentleman who in the course of the conversation asked him which were his favorite books in the field of physics and natural history. I will show you my books, replied Descartes, if you will follow me. After this he led his guest to the courtyard and pointing to the body of a calf that he had just received from his butcher and that he intended to dissect the next morning, he said, "These are my books!" Another example may be taken from Francis Bacon. "The human intellect," says Bacon in his *Novum Organon*, "is carried to abstracts by reason of its proper nature, and feigns that those things, which are variable, are constant. Better is to dissect Nature than to abstract her, as did the school of Democritus, which penetrated farther into Nature than the rest did. Matter might rather be considered its structure and changes of structure . . . for forms are fictions of the human soul, unless it be allowable to call the laws of action forms" (*Nov. Org.* I, 51).

Vesalius was one of the great representatives of this school of Democritus which is praised by Bacon. To compare his work with that of Galileo or Descartes may at first sight appear to be arbitrary. Vesalius, Galileo, and Descartes were not concerned with the same problems. Nevertheless, we find a close intellectual kinship in these three thinkers. They are three classical witnesses to that scientific spirit which began to rise in the sixteenth century and came to its climax in the great philosophers and scientists of the seventeenth century. By its adversaries, by the defenders of the philosophical ideals of the Middle Ages, this new spirit was always denounced as a sceptical spirit. This charge is not entirely unfounded, but it is inadequate and superficial. Scepticism was, indeed, one of the necessary elements in the development of modern science and philosophy. Without scepticism the power of the philosophical tradition could not have been broken. When compared to the various sceptical schools in Greek philosophy this modern scepticism is, however, of a new and entirely different type. It is a positive not a mere negative attitude. Descartes always emphasizes that his "universal doubt" is to be understood as a methodological, not as a metaphysical doubt. The Cartesian doubt was a constructive not a destructive one. The same constructive doubt had, a hundred years before, marked its stamp upon Vesalius' *De humani corporis fabrica*. Without a deep mistrust of the great medical authorities, of Galen and Avicenna, Vesalius could not have written this book. He had to begin as a heretic in medicine in order to become the founder of modern anatomy. *In anatomia*, he said, *non opinandum sed certe et ostensive sciendum est*.

It would be a better description of the modern scientific mind to call it an analytical rather than a sceptical mind. In the sixteenth and seventeenth centuries we can follow up, step by step, the great triumphs of this new analytical mind. With Vesalius it begins to conquer medicine; with Galileo it conquers physics, with Descartes geometry and philosophy. Galileo owed some of his most important results to that method which he himself described as *metodo risolutivo*,—as the method of resolution. Descartes began his philosophical work with a great mathematical discovery, the discovery of analytical geometry. Vesalius' *Fabrica* published in 1543, Galileo's *Discorsi e dimostrazioni intorno a due nuove scienze* published in 1636, Descartes' *Geometry* published in 1637 are three mile-stones set up on the road that led to our modern conception of science.

Although moving in different directions and aiming at different ends these works are inspired with one and the same tendency of thought. They are the expression of a great intellectual crisis which was felt everywhere. In the field of natural science the scholastic method had ended in a complete failure. Not a single law of nature had been discovered in the Middle Ages. In medicine the implicit faith in the authority of Galen remained unshaken for more than twelve centuries. Before Leonardo da Vinci nobody had the courage to see with his own eyes and to judge by himself. It became imperative to find a new approach to nature and a new method of investigation. All this is expressed in Bacon's laconic saying; *melius est naturam secare quam abstrahere*.

To dissect nature in order to study nature was, to be sure, a precarious and dangerous enterprise. But the great scientists and philosophers of the Renaissance were bold enough to defy this danger. For to all of them the dissecting of nature was only a first preparatory step. The analytical process was to be followed and to be completed by a synthetic process. In Galileo's science the method of resolution is not opposed to the method of composition. On the contrary, the former method prepares the latter, the analytical method paves the way for the synthetic method. In the same sense Vesalius had to begin with dissecting the human body in order to find out its structure, in order to describe the *fabrica humani corporis*. Only by such an experimental analysis could medicine enter, to use the terms of Kant in his preface to the *Critique*, "on the high way of science." *Experimenta anatomica et practica*, said Vesalius, *firmissima, inconcussa et unica medicinae solidae fundamenta sunt*.

DR. FRANCIS: An old friend of Cushing, sharing his love of collecting old books and his idolatry of Vesalius, Dr. Streeter has been of the greatest help to this library, and is honorary Curator of its Museum collections. Finding no more bookish worlds to conquer, he switched to the collecting of other antiquities of medicine and science, especially weights and measures.

The charm and perfection of his writings make all his friends regret their rarity. One of the most charming tributes to Osler that I know, four pages headed

"Impromptu in a Library," begins with a torrent of pseudo-abuse heaped by the kindly Osler on our next speaker—"You scoundrel, you scathless and complete villain, you unmitigated"—the rest was apparently unprintable. It seems that Dr. Streeter at a book sale had unwittingly beaten him to a desiderated Leoniceus, an old worthy whose familiar name I am shocked to find vulgarized by the modernizing youngsters in charge of this Library into "Lonigo," which painfully suggests my unuxorious fellow-countryman Lonergan. We are impatient to hear what this master—I refer to Dr. Streeter—has to say about Vesalius at Paris.

VESALIUS AT PARIS

EDWARD CLARK STREETER



UNIVERSITIES are hostile to Genius," said Emerson. He might have cited the University of Paris and Vesalius as a case in point. For here was a genius who had articulated with destiny to dedicate himself, his gifts, his splendid impatience to Reform; and here a University so encrusted and anklyosed with Conservatism that there was nothing quite like it in Europe at the time. What was Vesalius doing in that high, hushed Temple of Authority, that Depot of Bigotry, where studies in the schools had subserved the Faith for twelve generations and more? Did he hope at 19, by some open process, to supple the hard unintelligence that reigned in those schools, "so great, so rich, so *rigid*" (as Rabelais describes them), where, if a scholar dares pronounce *quisquis* or *qualis* in other than the medieval manner he is like to be stripped of his dignities?

Vesalius went down to Paris to matriculate in Medicine in 1533, according to Cuneus; he continued to work there for the next three years, mainly under Jacobus Sylvius and Guenther von Andernach. He had fulfilled the requirements for the Doctoral Degree; within the half-year he would receive from Paris the bonnet and dignity of Doctor Medicinæ. But war between France and the Empire again threatened. Vesalius, bound by every tie to the side of Charles V, left Paris at once for Louvain, his only title, "Candidatus medicinæ."

But how he had earned his Candidacy! He had shown address in outsmarting authority in Paris, in avoiding brushes with bigotry, in attacking that type of Galenism upheld by the master of Trinquet, that enraged and mighty man, Sylvius of Amiens, Galen's redoubtable Vicar on Earth. He had raised angry and dangerous questions—and threshed them out in a series of disputes—in which all the arts and entrenchments of eloquence and book-learning were on the side of Sylvius, and all the facts on the side of Vesalius.

Advised by his mentor Cardenas, Vesalius had chosen Sylvius as preceptor, because Sylvius was a peerless organizer of medical studies with a "certam methodum docendi," a mathematical mind, with a Gallic sense of form, and a flair for nomenclature. The course covered three years. In the first year came generalities, internal medicine on the basis of twelve treatises of Galen, one of Hippocrates, the third book of Paulus, and Gatinaria on fevers, with

Flornas

lesser attention to Arabic sources—Mesue, Haly Abbas, Rhazes. We may picture Vesal's impatience waiting the end of these divagating sessions, the final cautions against mistaking a julep for an apozene!

The second year was to be devoted wholly to Anatomy. Sylvius had taken his degree at Montpellier only four years before; Montpellier where Rabelais, Peter Tolet, and others had been laboring to advance the science of anatomy; here was nurture indeed, direct from the favoring South! But nothing of the sort came from Sylvius, not the faintest meridian echo. With every mark of devotion, the old man intoned the text of his God-like Galen, *sicut Evangelium*. He declaimed from *De usu partium* and then from *De motu musculorum* in Latin renderings which were at least two centuries old. He produced for dissection a few dogs, cats, swine, and doubtless would have added the dog-faced monkey and bear recommended by Galen if he could have had them cheaply. This mummary and adulation of the suspect Pergamene would have run on through the precious year 1535 and, with Roth, we could have set that pregnant time down as pure vacancy in the career of Vesalius had he sat down in gloom, discomfited. But the tough hearts of those who pioneer grow tougher under disappointments. Vesalius was galvanized into action. He plotted to end those traffickings with the seven types of lower animals which Galen allowed as substitutes, and to humanize the study-material at Trinquet. At the risk of his life he made forays to the gibbets of Montfauçon and the graves in the Cemetery of the Innocents.

"I acknowledge no authority save the witness of my own eyes" said this champion of the *visum et repertum* method. "I want liberty to compare the dicta of Galen (Prince of Physicians!) with the tangible facts of bodily structure." He labored constantly to improve the technique of dissection; he tells how he thrust aside the bungling barbitonsors who, he says, "had made a mess of the eight muscles of the abdomen which they exposed in torn and sadly confused order" and how he carried on, layer by layer, dissections of the muscles, vessels, nerves, bones. Such skill with the knife had not been seen before in the city on the Seine. He performed the "Public Anatomy" of that year (and the next) single-handed and alone, *solito absolutius*. It was the third he had ever seen.

"I undertook to do this at the urgent request of teachers and students alike [as though Vesalius needed urging!]. It was a pretty accurate performance, in the course of which I tried to show all the muscles of the hand." Shades of Leonardo, of Canano, whither will the ambition of this fellow lead him? Does he not know that

the hand is the last test of the practised anatomist? That he knew this well, we gather from the Calcar portrait, page 6, in the *Fabrica*, which is also a portrait of a dissected hand and arm. He put this scene before us, in the opening pages of his book, trusting that no man would connect this symbolic portrait with his sojourn in Paris—but, barring the great beard, this action-figure fits fairly well into the scene of that first *coup d'essai* on the hand of which we were speaking, the "Public Anatomy" in Paris in 1535.

If one would build a new vision of the human body as the central object in the glorious order of the universe, we assume that there are various ways of going about it. Vesalius saw only one: begin by removing obstructions; liquidate the liveried bondsmen of Galen; topple Sylvius from his sphere, hurl him into the void whence he came. *Delenda est Lutetia!* Make a clean, clear space around, that men can see your new construction in its grand outlines, the scale of its parts. And so he was impelled in the *Fabrica* to dramatize and exaggerate those differences between Padua, "the most praiseworthy school in the whole world," and the schools of Paris, now grown Lilliput in retrospect, shrunk, dwindled to nothingness.

In denouncing the Paris School Vesalius was swayed by a motive as immediate as his method was direct. By 1543 he felt that the *Fabrica* must signalize an unequivocal break with the past, its styles, aims, and trappings. To effect this break Vesalius had only one deft stroke to make, namely, to split off the old Paris Studium and cast it in the discard. For in Paris, the vice of crass Galenism was set at its deepest. A clean break with Paris would high-light that deep-going division between his own accomplishment and what had gone before; would clear him, too, of the odium of having submitted, in his youth and inexperience, to such mean schooling in anatomy. And so, unhesitating and Rhadamanthine in censure, he dusted off the entire Paris group, with quite obliterating effect. "I recognize none of them," he declared. "There is no real teacher among them anywhere." He was ruled now by his disgusts, forgetting his old admirations for Jean Fernel, Pierre Brissot, Vassaeus, Oliverius, *et alios quosdam*.

There are hard terms in use in old quarrels that make us long to lay a finger pausefully on both parties to the quarrel, but mainly on him who has begun to talk for victory, abandoning the cause of truth. "Hold! Man of Wrath! A mad gambit you make, to attain your ends! The point you wish to establish is simply this: your work at Padua stands poles apart from theirs in Paris; separate it

by diameters of that new solar system of Copernicus, if you will, but learn to live and let live."

But the Fleming had singled out Sylvius for slaughter, and would make an end of him. By contrast he treated his other tutor, Guenther, with gentleness, at least until 1540. "A man blessed with many gifts of mind," he says, "who has helped the cause of medicine more than anyone else." "A teacher most liberal and most learned; I received the major part of my studies from him." Vesalius admired the *promptitudinem vertendi* of this veteran translator who had already made Latin renderings of close to forty treatises of Galen, Paulus Aegineta, and part of Oribasius, when Vesalius came to study with him. "He commanded a singular variety of words" is the sly comment of his pupil.

Guenther would have made a philologist out of the Fleming, if he could. But Vesalius heeded the words of John Manardus: "So bottomless is this sea of medicine that we see men who think themselves elephants in bulk sink quite out of sight in its engulfing floods." Guenther's pupil had no desire to plunge into that wild gulf of philological learning; he chose to throw his weight around with his feet on resistant firm ground.

This young man's mounting animus against Paris was compounded of as many simples as his father's variously compounded Mithradate. For one thing, Vesalius in Paris became allergic to bigotry. Following the night of the "Placards" he had seen some forty good men of the Reform burned at the stake for their heresies; seen Calvin hounded from the city; the Corporation of Royal Readers molested; exponents of the New Learning suffering rank outrage at the hands of the infuriated Sorbonists. Commotions at Louvain had been lamb-gambols compared with this. At Louvain Vesalius had heard someone publically brand Fuchs, Manardus, Curtius, and Brissot as heretical Luthers of Medicine. But in Paris, in the spring months of 1535 he saw how close to outright frenzy the "excited feelings" of Frenchmen could carry them. Here was unending clamor and *Tumultus* (the thing that caused Erasmus to shun Paris), a King and Court in perpetual oscillation, war clouds momentarily drawing nearer, and lastly that Supreme Faculty of Theology housed in the grim establishment of Robert de Sorbon, bent on blocking every forward motion of the human spirit, seeking to bedevil the honest inquisitive intelligence (or what was left of it) in western Christendom. Bigotry ever lay in his mind as constituting the chief demerit and woe of France. Paris would continue to

negate any new revelation of experiential truth, precisely as she did in the days of Bernard of Clairvaux (who said to Abelard, "And who are you, pray, that truth should make its Epiphany to you and no one else?"). In the same spirit, couched in the coarsest terms, had not Sylvius rehearsed that scene, over and over again?

Another sore point should be mentioned. It is possible that grievous hurt to his pride had come to him more directly, for then, as now, the Parisians found matter for satire in the speech and behavior of the men of Flanders. And lastly, Paris reminded him of his own "beginnings." He had the strongest distaste for what he styles *meos juveniles conatus*. Acutely self-critical, evincing all the dissatisfactions of a true artist, he deplored the crudity, the amateurish quality, of his earlier writings. "These poor things are valued far beyond their worth," he said. In his reply to Fallopius we find him still belittling the work he did in Paris; "I was a tyro at dissection in those days." We must let this quaint understatement of fact stand for the moment while we take up the conflict with Sylvius. This had generated in Vesalius an achieving energy, a sense of power, of control over material, which in a more favorable environment might have eluded him altogether. Sylvius was no fool, no puny *chetif maître d'école*; to oppose him, to beard him when he was at fault, to set about supplying all the deficiencies of his teaching and all but usurp his teaching function, would stretch the capabilities of any youth of nineteen. Little as he liked combat, Vesalius thrived and gained more in that year 1535 than in any year of his life. By opportunism, by employing all his young skills, ardors, endurances constantly, in school and out, he turned the giant opposition of Paris to his own advantage. Largely self-instructed (and what better instruction is to be had?) he came off with an equipment of brain and hand more than adequate for the work that lay before him; within a year after leaving Paris (December 6, 1537, to be precise) he started teaching anatomy publicly at Padua. The Venetian Republic was not in the habit of assigning that post to a mere "Tyro in dissection."

For seven years after leaving the Paris scene Vesalius kept his peace,—then appeared in the *Fabrica* these bright and deadly fragments of criticism which spelled recusancy and rebellion. He let his pent-up rancor have free play. He followed the literary feud-pattern of his time which allowed him *ad lib.* to villify his opponents, who in this case were his old instructors. If ever a medical man did trespass and violate more superbly that part of the Hippocratic

Oath requiring love and reverence for one's teachers, we have yet to find that one. Here yawned a declivity, smooth and terrible, down which the warring disputants of that age slid with happy abandon. Few were those engaged in high argument in the Renaissance who kept themselves unspotted, refusing to descend to personalities. Oddly enough it was Vesalius' close friend John Sturm who was protesting most effectively at Paris against the tradition of venom and brutality in divisions and wordy encounters of this kind—*illa contentionis rabies*, "that mad-dog method of wrangling," as he termed it.

Vesalius' tone was wrathful. He hurled no roaring *défi* at his old Alma Mater, but set about destroying her in quiet commando fashion. He slipped all his old allegiances. He quite forgot the debt that he owed to the deserted cause of Galenism; forgot that the heroism and originating qualities that had developed in him during his rejection of Sylvian Galenism were products, in part at least, of the thing rejected.

He denied all efficacy in the method of teaching Anatomy in France,—it was stupid, partial, misrepresentative, dishonest. His deflation of the Paris program was so complete, he put so ill a complexion on French medicine, that some of his contemporaries inferred (as Leonhard Fuchs did) that his three years in Paris were misspent, barren of result. Such is the view held by his biographer Roth, also, for Roth invariably takes Vesalius at face value.

We think "he does protest too much" against Paris, with too strong a taint of "Ciceronianism." Needlessly vicious of him to disparage Guenther, for whom he had real affection, yet pitilessly he drags in that awful recollection that he had never seen Guenther take knife in hand except to carve mutton at the domestic board; that glimpse, too, of old Sylvius beating a hasty retreat from the class-room to avoid witnessing the student dissections which followed his readings. Vesalius was too intent upon validating his new method, and too pressed for time, at this juncture, to allow him to be partly protective, partly beneficent.

"Lord defend me," writes Guenther in 1535, "against those who force their way into our class-rooms and with slim pretensions to learning criticise our teachings; which they cavail at but cannot correct." This was mild baiting compared with what Sylvius was undergoing from his young pace-maker and prosector Vesalius. One day the Fleming forced his teacher to confess before the whole class that he now could see (what he failed to see the day before) actual valves guarding the orifices of the great cardiac vessels. Galen, says Sylvius, states that the lower maxillary is formed of *two* bones.

"The facts stand against him," cries Vesalius, producing specimens from the grave-yard of the Innocents. Established dignities and long-reverenced authorities carried no weight, apparently, with this outlander—he was after the Truth; he would expose it; before the eyes of all, by subversive legerdemain with a long-bladed knife and a cadaver before him. Sulky and mocking and jealous, Sylvius chose to submit rather than lose his fat fees through a possible revolt among his students.

In della Casa's treatise *Manners and Behaviors* occurs this phrase: "These Flemings, it would appear, have taken upon themselves to conquer all countries wheresoever they come." Can you not see Sylvius fiercely underscoring that passage with a quill dipped in iron, gall, and green vitriol?

The Fleming was not the only Reformer troubling the Latin Quarter of Paris in that year of 1535.

If Vesalius, like Jerome Cardan, had cared to chart the starry courses of his contemporaries active in the schools at this time he would have had some very strange horoscopes to fathom. Take the case of Ambroise Paré, for example, currently absorbing anatomy "from the multitude of dead in the Hôtel Dieu"; or take one who is still nearer to hand, take Michael Servetus, who has been trying this whole year of 1535 to scrape acquaintance with John Calvin at the college of Fortet; what are the auguries, what do the stars declare about Peter Ramus, Sturm's prize pupil at the College of Navarre, or about Etienne Dolet, or about that sound Grecian and idol of the unlettered vulgar, François Rabelais, in whose copy of the Greek Galen is written in bold hand, "This Galen is an uncommon dull fellow, a dud, a lump of lead" (*plumbeum* is the Rabelaisian word)? Or what shall he prophesy regarding the lame Knight of Christ, his friend, Ignatius Loyola, who on August 15 of last year, in the crypt of St. Mary's on Montmartre founded the Jesuit Order, precisely at the time when he, Vesalius, was founding (under favoring stars) modern anatomy in the crypts of the Innocents, on the old Rue St. Denis, five good bow-shots away.

If there was any exchange of letters between Vesalius and his Paris tutors in the ten years between 1536 and 1546, this correspondence has been lost. But from Nymwegen, in 1546, Vesalius indited a letter to Sylvius which drew from Sylvius a reply to this effect: Should you desire to consider yourself a correspondent and friend of mine, you must first retract all that you have said by way of criticism of Galen. The counterblast to that stupid insult is

contained in the China-root Epistle written at Regensburg that same year. Vesalius was now Caesarian Medicus of the Emperor Charles V, who had four times waged war against France. Not unpleasing to that Prince was the manner in which his Medicus, with fire and furibund energy, returned to his attack upon Paris.

"I recognize no real teacher among them—not one in the whole group!" He declared again, with vehemence, that he was in no wise beholden to his Paris teachers for his anatomy. As for Sylvius, let that sorely jealous man check his Galen against actual findings, or get some abler hand to do it for him. Roth says that this passage bespeaks a noble pride, or *edeln Stoltz*. It serves to veil, at all events, vital facts regarding the author's whilom relationship to that Paris group and his hard-won advancement on the Rue de la Bucherie. However, Vesalius, three years previous to this, in the *Fabrica*, had given us our prime clue to this relationship. "The instruction there [meaning in Paris] would have come to naught had I not taken hand in the work." Indeed, by taking hand in the work, by direct action, by independent countervailing effort, by grace of that wisdom and valiancy with which some men in their nonage are endowed, Vesalius in Paris had somehow contrived to form himself, to fit himself, for his Paduan period.

His impact upon that school had been immediately felt—reflected in the work of Charles Estienne, his ignored class-mate under Sylvius in 1535. This strangely mixed instruction carried on in the anatomical theatre at the College of Trinquet had not "come to naught." Vesalius could now counsel with himself and define his purpose anew; he would strive with open mind for such perfect knowledge of the framework of man as was humanly possible to attain through the senses; and he would have posterity know that it was *Vesalius* who *first* truly explored and charted what Rabelais calls "that abyss of Science," Anatomy.

DR. FRANCIS: Our next speaker is a worthy modern successor of the scholar-printers who did so much for the advancement of learning in the Renaissance. There is no end, I believe, to what Carl Rollins knows about printing and the making of books. Moreover, this knowledge and experience are always on tap for his friends. Who could speak better than the Printer to the University and Professor of Bibliography, himself a new Oporinus, about the publication of the *Fabrica*?

OPORINUS AND THE PUBLICATION OF THE *FABRICA*

CARL PURINGTON ROLLINS



FOR ONE UNLEARNED in anatomy, and having "small Latin and less Greek," it seems presumptuous to speak here of Andreas Vesalius and his *Fabrica*, or, indeed, of John Oporinus the printer and his edition of that great work, for he, too, was a scholar of no mean parts. If I speak with caution of the author—and, indeed, in view of those who also speak here today I have little right to speak at all—I feel more at ease with the printer.

The printed book, whether its skin be red or black or yellow, whether it be fat or meager, or tall or dwarfish, whether it speak in the classic tongue or in the vernacular, has an anatomical structure describable in the *lingua franca* of my trade.

When "the Gothic sun set behind the giant presses of Mayence" it left concealed in the shadows the *when* and *where* and *by whom* the art and practice of printing with movable types originated in Europe. But by the time the *Fabrica* issued from Oporinus' presses European printing was a century old, and its processes had become less a mystery than a mastery. The great formative years in Germany and Italy were drawing to a close, even as in Basel the pioneers and the great master had passed away.

It was no fortuitous circumstance which brought Vesalius and his book to Basel. The young Belgian genius must have passed through the city on his way to Italy. Basel stood at the gateway to the Rhine valley, between the Jura and the Black Forest, on the great trade route between Italy and central Europe. As became its strategic position, it gave much of its energy to trade; but following the foundation of its university in the fifteenth century it became in time the center of humanism in south Germany. Erasmus and Holbein and Zwingli had given it distinction, and able scholars had taught there. But its special attraction for Vesalius was in the person of a scholar interested in medicine and in publishing.

John Oporinus was a native of Basel, the son of an impecunious painter named Herpst. From his father he got his early education;

four years of Latin and Greek followed at Strasbourg under Gebwyler, and further study at Basel. Next came a teaching job and an interesting connection with Xylotectus at the Monastery of

ORATIO DE OR-

TV, VITA, ET OBITU IOANNIS
Oporini Basilicnsis, Typographicorū Ger-
manicæ Principis, recitata in Argenti-
nenſi Academia ab Ioanne Hen-
rico Hainzelio Auguſtano.

AVTHORE ANDREA IOCISCO SILESIO,
Ethicorum in eadem Academia profefſore.

Adiunximus librorum per Ioannem Opo-
rinum excuſorum Catalogum.

VEL INVITIS PIRATIS:
QVOD PER PIRATAS LICEAT.

ARGENTORATI,
Excudebat Theodoſius Rihelius,
M. D. LXIX.

Title-page of the rare biography of Oporinus by Andreas Jociscus, published by Rihelius of Strasbourg in 1569. [An English translation prepared in connexion with the 400th anniversary celebration and the preparation of this paper has been deposited in the Historical Library.—Ed.]

the lectures, but he became secretary, laboratory assistant, and even valet to the great man. Life with the master at Basel, and later for a brief period in Alsace, was not a happy one for the pupil and he wrote rather bitterly of his experiences. Still, the months at Colmar were not too unhappy, for he left his Xantippe in Basel.

St. Urban's. It was after his return to Basel that he first touched printer's ink—which never comes off the fingers!—by copying manuscripts for Froben, the greatest of Basel printers. At this time he came to know Erasmus, who liked the younger scholar. He learned Hebrew under Thomas Platter, and, save that he disliked contention and needless argument, thought of studying law. He married at twenty the widow of Xylotectus—not without an eye to her more ample means—but his knowledge of learned tongues helped him not at all with the unruly member, his Xantippe.

About this time Oporinus' career was to be affected by the coming to Basel of that somewhat eccentric genius, Paracelsus. Through the offices of Froben, Oecolampadius, and Erasmus, Paracelsus had come to lecture at the University. Oporinus was advised by Oecolampadius to study medicine under the new teacher; he not only attended

After Paracelsus left Colmar, Oporinus returned to Basel, gave up the idea of becoming a practitioner of medicine, and took up teaching again. In 1533, at the age of twenty-six, he became Professor of Latin in the University through the good offices of Grynaeus. Four years later he was made Professor of Greek and Dean of the Collegium Sapientiae, where Thomas Platter also taught. In 1539 he exchanged the class-room for the *officina*, to become the foremost printer of his generation in Basel.

Oporinus' active participation in the printing business began in 1536, when, in company with Platter, Lasius, a skilled compositor, and his relative Robert Winter, he bought the printing house of Cratander, though his name did not appear in the firm's colophon. The partnership went badly, and after a few years was dissolved; the partners' wives interfered in the business, and Lasius, resenting, as compositors have done before and since, the meticulous proof-reading of Platter, the two partners proceeded to punch each other's noses. That was the end. For a while Oporinus and Winter printed together, but soon Winter withdrew, and Oporinus continued alone. I dare say that after the vicissitudes of the partnership Oporinus might have said, as has a modern fellow-craftsman:

"This has been an awful winter:
O God it's hard to be a printer."

But until two years before his death in 1568 he remained in business, though not without many a bout with the interest-charging loan-sharks of the day. He married three times after the death of his first wife: his second seems to have been a clever and affectionate woman, but a poor manager, who may have had something to do with his forsaking the teaching for the printing. He seems to have been a simple man, with the scholar's and the craftsman's instincts rather than those of the trader.

It was to this man, with his knowledge of the classic tongues and of medicine, as well as his acquaintance with the intricacies of printing, that Vesalius turned when the problem of the publication of his new work on anatomy confronted him. There were skilled printers at Venice, but he knew Oporinus, and before this he had had two or three books printed, probably by the four partners, though only Winter's name appears in the colophon.

On August 24, 1542, Vesalius wrote from Venice to Oporinus at Basel that shortly he would despatch the manuscript and wood-

blocks of the *Fabrica*, and that before long he would himself go to Basel to help the work along. If, as Dr. Cushing surmises, it would take three or four weeks for the shipment to reach Basel on donkey-back over the tortuous, precarious Alpine passes, Oporinus may have had the precious cargo in his printing-house by late in September. We may well imagine his satisfaction at the prospect of having an important hand in the publication of such a work, for he could not have been unaware of the revolutionary character of the *Fabrica*. Galen was yet a name to conjure with: a five-volume edition of his work had been issued in 1538, and Vesalius was a young rebel whose empirical methods threatened the supremacy of the old master, and Oporinus knew enough of medicine to understand what Vesalius' work was all about.

It would seem that the printer must have entered on his part of the work without delay. For the book was published, according to the colophon, in June of the next year, 1543. Now, between the first of October and the last of June there would be, if we count out only the Sundays, and allow an average working day of twelve hours (though whether the printers could have worked that long in the winter days of the latitude of Quebec is doubtful), some 2800 working hours. I suppose that it would take a good compositor an average of five hours to set an average page of the *Fabrica* and get it ready for press, so that the seven hundred pages of the book would require the services of one man working steadily for nearly a year. And this presupposes that he had at hand an adequate supply of type and accessories. We have no means of knowing many of the details we would like to know about the operations in the printing-office, but we can safely conclude that of Oporinus' six presses several must have been at work on the *Fabrica* at one time, while four men at least must have been concerned with each press.

Let us look at the anatomy of the *Fabrica*. It is a large folio printed on what is known as demy size paper. Each sheet, printed with two pages on each side, is folded once to make a folio of four pages; in general three of these folios were put together to make a gathering of twelve pages. The paper is rather thin and soft, quite different from that used in such a book as Gutenberg's 42-line Bible. Oporinus' paper was probably made at Basel, for there had been paper mills there for more than a century.

The type is a creditable roman letter, by no means as handsome as the earlier Jenson, nor as comely as the later Garamond, and of

no especial significance. The italic, which is freely used throughout the volume, is known as "Basel italic," and was highly esteemed at the time abroad as well as at home, having succeeded in popularity the Aldine italic. Where Oporinus got the type cast, and how much he had of it, are questions which we cannot answer with any degree of accuracy. But some figures may be of interest. The text type is of a size known as *Grobe Texte* (equivalent to our sixteen point), and there are about 5,000 characters to a page not counting spaces, but throwing in the smaller type in the margins for good measure. By the hand method then exclusively in vogue, a good workman could have cast the type for one page in a couple of days. For the successful, uninterrupted operation of one press, allowing two compositors and two men at press, some three hundred pounds of type would have been required as a minimum, and an equal amount for each press employed.

The curious error in pagination for some one hundred and eighty pages after page 312, suggests that one crew worked on this portion of the book, while another companionship was at work on the other pages—thus at least accounting for two presses. Even if there were but two presses regularly employed, it was a tight squeeze to get the work out by the end of June,—especially if Dr. Cushing is correct in his supposition that after Vesalius' arrival in Basel in January of 1543 the work was speeded up, which suggests that it progressed slowly between October and January. But if Oporinus really did some seven hundred books in the twenty-eight years of his labors as a printer, we can safely say that he and his printers were skilful and rapid workers.

The great fame of the *Fabrica* rests not on the details I have been considering, interesting as they are, but, justifiably, on the superb wood-blocks which not only adorn but are the very marrow of it. These illustrations were undoubtedly drawn by a wandering Dutch artist named Calcar, and were made at Venice. They were cut (though there are also clear indications of some work with the graver) with a knife on the flat boards of apple, pear, beech, or sycamore. I have no need to emphasize their merit as drawings, since others have done that better than I can do, but I would call attention to their excellence as examples of expert craftsmanship in woodcutting and in their appositeness. They really do illustrate with great clearness and fidelity the text which they accompany. And they have been printed with great particularity—partly, per-

haps, because of the careful directions which Vesalius gave in his letter to Oporinus. Attention should also be given to the woodcut initials in two sizes, which are exquisitely drawn and carefully cut. They represent scenes in the dissecting room, and for charm and effectiveness they may be recommended to the attention of those scientific writers and printers of to-day who cherish the bleak and naked type page.

The *Fabrica*, like other books of the time, was issued in sheets, unbound. It was sold, at least in part, at the great fair at Frankfort, whither Oporinus, like his fellow printers of Germany and France, repaired for the purpose. That the work justified itself is emphasized by the fact of a second edition in 1555, while the enduring value of the woodcuts (and even of the very wood itself!) moved the New York Academy of Medicine to issue a reprint of the plates in 1935, using the originals preserved in Munich.

Vesalius' *De Humani Corporis Fabrica* is a landmark in medical history: if not also one in the history of printing, it is most certainly a "fine and unusual volume," as Updike says. As the printer studies it, he must pay respect to the diligence and skill of the handicraftsmen who made it. And if the proper study of mankind is man, the proper study of a book is the book itself, and I invite your respectful consideration of the *Fabrica* in its essential quality of a book perfectly adapted to its purpose.

DR. FRANCIS: We are now to hear the pros and cons of Vesalius *versus* Galen from a master of the subject. Professor Arturo Castiglioni, a graduate of Vienna and formerly clinician and health officer at Trieste and in Rome, made himself an expert in the history of medicine and graced the chairs in that subject at the Universities of Sienna and Padua. To him we owe the great text-book of the history of medicine which has been translated from Italian into French, Spanish, and English. In 1927 I had the privilege of hearing him address an international gathering at Leyden in his mother tongue, and never have I heard such an orator. We have few reasons to be grateful to the *furore Fascista*, but here is one—it has given us Professor Castiglioni.

THE ATTACK OF FRANCISCUS PUTEUS ON
ANDREAS VESALIUS AND THE DEFENCE
BY GABRIEL CUNEUS

ARTURO CASTIGLIONI



THE FIGHT for and against Vesalius began almost immediately after the publication of the *Fabrica*. It was characterized by two facts: the first, that many of Vesalius' followers adopted his ideas, plagiarizing his book, badly reproducing the anatomical illustrations and sometimes suppressing his name, often presenting the whole as a new interpretation of Galen's anatomy; the second, that the attacks against Vesalius by those who were decidedly faithful to Galenic teachings were extremely violent. In the China-root Epistle (1546) Vesalius says that many of the most learned men of the time had already expressed publicly their approval of his work. In Germany Prof. John Aeccius in Cologne, Gerhard von Veltwyck, Joachim Roelants, a good friend of Vesalius, and Conrad Gesner of Zurich asserted publicly that they admired Vesalius' book and accepted his opinions, and Janus Cornarius, one of the most learned men of his time, declared he would purge Galen from all places which were attacked by Vesalius. On the other hand, Sylvius, the famous Parisian anatomist and leader of the Galenists, whose judgment Vesalius had been awaiting anxiously, attacked him very sharply, inviting him to recant all his assertions. In a book published in Geneva in 1551 he heaped insults on his former pupil. I don't believe it necessary to deal with this attack in more detail, because the part which was played by Sylvius in defence of Galenic doctrines and the form of the insults which he showered on Vesalius have been exhaustively related by Roth and by others.

In behalf of Vesalius rose Leonhard Fuchs in his book of anatomy published in 1551, Philip Melanchthon who in the second edition of his book *De Anima* (1552) quoted expressly the tables and the book of Vesalius, and Renatus Henerus of Lindau who assumed openly the defence against the calumnies of Sylvius (Venice,

1555). Ambroise Paré in his classic book, the *Anatomie universelle* (Paris, 1561) declared that he considered Vesalius as the best anatomist of his time.

The fight was less violent in Italy where anatomical teaching had a well-founded historical background. The Galenists were strongly in defence of the scholastic doctrines, but it was clear that Vesalius' teaching was appreciated everywhere and his book was known to all anatomists, who were sometimes less courageous than Vesalius in attacking Galen; they sometimes put in doubt, often corrected or completed through new discoveries, some description in the *Fabrica*, but the Italian anatomists were almost unanimous in recognizing his great merits as a teacher, even though some of them attributed to Berengario the founding of the Italian school of anatomy. Johannes Philippus Ingrassias, leader of the Neapolitan school, who had accomplished original work in anatomical research, declared that Vesalius should, without doubt, be considered the prince of all anatomists. Among the enemies of Vesalius we have to quote the Spanish anatomist Valverde whose book was published in 1556. As one of the critics, but not the enemies, of Vesalius must be named Realdus Columbus, his former pupil who surely exaggerated when boasting of his own work. However, he certainly was one of the best anatomists of his time and his book represents real progress over Vesalius' anatomy. But the most prominent among the anatomists who followed Vesalius was Gabriel Fallopius, who taught anatomy from 1548 to 1551 in Pisa and from 1551 to 1552, the year of his death, in Padua. We have only one book by him, the *Observationes Anatomicae* (1561) in which he published a series of important new observations and a very benevolent criticism of Vesalius' work. Fallopius openly recognized Vesalius as his teacher and as the greatest anatomist, declaring that he followed his teaching and example and, in a very modest way, he presented his own corrections of some mistakes of Vesalius. His work is the most important contribution, after the *Fabrica*, to anatomy in the Renaissance.

Vesalius accepted Fallopius' book with the greatest interest, recognized the diligence of his research and wrote an answer to his book in a letter which was dated Madrid 1561, but which did not reach Fallopius. It was sent to Fallopius through the Venetian ambassador in Madrid, Paolo Tiepolo, who delayed his return to Venice, and when he arrived Fallopius was dead. This answer was published by Francesco Senese in Venice (1564), but Vesalius did not

see it: for he too had died, returning from his journey to Palestine, before it was published.

The two books of which I wish to speak are to-day extremely rare. They appeared almost contemporaneously with Fallopius' *Observationes* and Vesalius' answer. They play an important rôle in the fight between Vesalian and Galenic anatomy in which all the anatomists, the physicians, and also the philosophers of the time took an active part, and from these books we may learn many characteristic details in the history of this conflict. The book of Franciscus Puteus is the most violent of all attacks published after the first one which had come from Sylvius, the Parisian anatomist. It must be considered more significant because it was written twenty years after the *Fabrica*, at a time when it could reasonably be supposed that Vesalius' authority was universally accepted. In fact there was no longer any opposition to Vesalius by the anatomists; his book was quoted everywhere with respect and admiration, even though Galen's anatomical work had not ceased to be revered as a classic text.

Franciscus Puteus

Francesco dal Pozzo, Puteus by his Latin name, was the author of the *Apologia in Anatome pro Galeno contra Andream Vessalium* [sic] *Bruxellensem* printed in Venice by Franciscus de Portonariis de Tridino (1562). He was born in Villanova di Casale in Piedmont about 1520. His father Bartolomeo had been Professor of Philosophy in Vercelli, a small Piedmontese town, which played, however, an important part in the cultural life of Northern Italy. Francesco studied medicine in Pavia and later in Bologna where he attended the anatomical lectures of Bartolomeo Maggi. He then returned to Vercelli where he practised medicine, and died on November 29, 1564, in the same year as Vesalius. No other works by him are known; he may have published a letter on venesection in defence of his teacher, Matthaeus Curtius, but no copy of it is extant.

The voluminous book begins with a florid eulogy of the dal Pozzo family, to the most eminent member of which the work is dedicated, namely, Cardinal Giacomo dal Pozzo; the author expresses the wish that he may ascend the pontifical throne. The first chapter contains a very prolix outline of a history of medicine, which begins with Greek mythology and the snakes of Asklepios. The presence of the two snakes surrounding a well (Italian *pozzo*) in the coat of arms of the family is a source of great pride. This

historical introduction is written in the customary scholastic form centering the whole evolution of medicine in the genius of Hippocrates and Galen. The book itself is intended to be a violent personal diatribe against Vesalius, whom the author accuses of having impudently falsified Galen's words, deliberately ignoring some

assertions of his, denying that Galen had dissected human cadavers and that he had had any experience in the field of human anatomy.

The work contains a repetition of the enthusiastic affirmations of Galenic faith which belong to the usual rhetoric of the academic teachers of this time. The eulogies of Hippocrates and the classic medicine and especially of Galen which we find in the seventh book of Puteus' work in which the author asserts that everything which had been done in anatomy before Galen was perfectly void of any scientific thought, are the same which we find in almost all books of the Galenists. They are the expression of the time in which the rebellion against Arabian medicine had wrested the supremacy from Avicenna and the Arabians who had previously dominated the Italian schools. The better knowl-

APOLOGIA
IN ANATOMIE
PRO GALENO,

CONTRA ANDREAM VESSA-
LIVM BRVXELLEENSEM,

Francisco Puteo Medico Ver-
cellensi Authore.

*Cum Prefatione, in qua agitur de Me-
dicinæ Inventione.*

CVM PRIVILEGIO



V E N E T I I S

Apud Franciscum de Porronariis, de Tridino,
M D L X I I.

Title-page of Puteus' *Apologia* published at Venice in 1562. The volume is a small octavo, bound with Fallopius' *Observationes anatomicae*, Venice, 1561.

edge of the Greek language which begins with the Renaissance and the acquaintance with the classic texts had revealed that so-called Arabian medicine derived in its greatest part from the Greek authors, who had often been poorly understood and badly translated. Galen was rediscovered and the enthusiastic admiration for the great teacher made every attempt to attack his authority appear a heresy. Galen-

ism of the pre-Renaissance is not the continuation of an old faith: it is the revival of it to a degree which had never been reached before. This may explain the success of the splendid Giunta edition of Galen in seven volumes to which Vesalius contributed and which had ten editions in eighty years, and of the Lyonnese Roville edition which was many times reprinted.

In Puteus' book the discussion is based exclusively on the texts of Galen and of Vesalius with many quotations from Galen from the Greek original. Puteus is not a little proud to know Greek and he believes that this knowledge gives him a decided superiority over Vesalius. A sign of the new times, however, is that he understands that his arguments are weak, because he had been unable to check his assertions at the dissecting table. He had attended dissections occasionally, for instance, when the dissection of Charles III, Duke of Savoy, who died in Vercelli in 1553, was performed in the presence of many physicians, and he says that he was able to state by himself how erroneous were Vesalius' descriptions of the relation between the vena cava and the liver. Puteus showed, however, great imprudence when, confessing that he was not able to gather sufficient personal experience, he called confidently on the authority of some of the best anatomists and even advised any reader who doubted the verity of what he said to consult Albius in Bologna or Cananus in Ferrara, Fallopius in Padua, Cuneus in Pavia, or Petrus Martyr Tronus, calling them the most illustrious anatomists. "Don't omit, O students, to practise dissection very diligently; don't believe either Galen or Vesalius, but look yourself to the cadaver and you will be convinced." As we shall see, this advice, admitting and stressing the importance of personal experience and the authority of certain professors of anatomy, was very imprudent, because the anatomists who were so openly called into the discussion felt the necessity of making their position clear.

The whole book is written with such an outrageous hostility and is so heaped with vulgar insults against Vesalius that it is difficult to imagine the reason for this attack and for the language. Sylvius had been hurt by the fact that a pupil of his, whom he had praised as the best, had dared to rise against him; Puteus had never been Sylvius' pupil and had never had any contact with Vesalius, but in his book he calls him an insane, mendacious, vile, and often impudent man, he asserts that Vesalius has never understood Galen, having accepted the poor and often erroneous translation of Nicolaus

da Reggio. Puteus declares that he was compelled to write and to publish his book upon the invitation of many people to whom he had promised to collect his observations on the *Fabrica*. He felt therefore the necessity of bringing his beliefs to common knowledge.

Martinotti, who has devoted a very exhaustive study to Puteus and his work, of which he expressed a rather indulgent judgment, believes that Puteus might have been incited to write the book by Antonio Tesauro of Fossano, generally called Antonio Fossano. He was physician to the Court of Spain and later to the Duke of Savoy, was a very influential person, patron of the Academy of Vercelli, great Galenist and fierce enemy of Vesalius. This charge was first made by Cuneus, who attributed to the same Fossano an important rôle in the opposition against Vesalius at the Court of Charles V and Philip II, speaking of Fossano's jealousy of Vesalius. It is quite likely that Fossano and other Galenists may have instigated Puteus, whom we can judge from his book to have been a very ambitious man. He felt the desire to make himself conspicuous and acquire a great name, believing that by following Sylvius' example it was possible to obtain the approval of the Italian scholars. His quotation of a great number of physicians and philosophers who were decidedly opposed to Vesalius and whose names are accompanied by the most flattering praise of their wisdom gives us proof that Puteus was hopeful that his work would be accepted favorably. Beside Sylvius, who appears to be first on this list, we find the names of Branda Porrus, who had been a teacher of Puteus in Pavia and is said to possess "a more divine than human wisdom," and to be a prominent teacher of anatomy; Bartolomeus Catia (Catti?), an excellent physician and Galenist; Lanfrancus Bonapartis, Rector of the University of Pavia; Bartholomaeus Beiletus, "a very wise and benevolent man," and a great number of other professors and anatomists.

The need of Puteus to rely on influential scholars for his attacks on Vesalius is proved also by the ample description of the discussion after Vesalius' dissection in Bologna (1544). Following the example of A. Benedictus who, in his book on anatomy (Venice, 1502), had described a dissection in his anatomical theater and the following discussion, Puteus writes, "As Vesalius was on his way to Pisa, he stayed in Bologna where he attended the dissection of two corpses, performed by Bartholomaeus Maggi. Vesalius began to take part in it; not so much, however, as was wanted. He spent a

part of the day on which he arrived with the dissection and description of the veins and a discourse on the subject. It became very late in the night and the cold caused an interruption of the discussion. I knew that many people who were present did not like to interfere with his speech because they believed that on the following day Vesalius would come to the school to continue the discussion. But they were deceived, because early in the morning they learned that he had left for Pisa, and they were very bitter about it. The discussion, however, was so long and so exhaustive that it could not have been better if Vesalius had attended." Of this discussion, Puteus, in order to give a proof of the opposition of the professors against Vesalius, gives a full report. First of all spoke Ludovicus Buccaferreus, professor of philosophy, who began supporting Aristotle's doctrine against Galen, but was interrupted and hissed by the audience. After him spoke another professor of philosophy, Antonius Franciscus Fabius, then Jacobus Pacini, lector of philosophy and of practical medicine. Another philosopher and physician, Victorius Faentinus, a venerable old man, as Puteus says, took the floor; he was "no less versed in medicine than in philosophy" and had taught medicine in Bologna and in Padua. At the invitation of the students, Domenico Bonfiglioli, also a philosopher and physician, expressed his opinions on this subject. Bartholomaeus Maggi, the only anatomist among the disputants, took up the problem of the origin of the veins and affirmed very clearly his fidelity to the Galenic doctrine. Finally, Alcides Bonacossa, who had also been professor of medicine and philosophy in Bologna and was considered a great orator but, as Puteus says, "was little known because of his poverty," was the last to take part in the discussion.

The students were aware that it was very late and the discussion which had lasted the whole day had been nothing but a philosophical contest without any attempt to reach a conclusion, and they insisted that it should come to an end.

It is remarkable that not one of those who spoke made any reference to the cadavers which were lying before them, and only Maggi quoted Vesalius very cursorily. No one referred to practical examination of the organs. The whole discussion dealt with the problem of how far Aristotle had been right in admitting the origin of the veins from the heart and how decisive was the assertion of Galen that the liver had to be considered as the center of the vascular system. With the exception of Buccaferreus, the first speaker who

had been hissed by the students for his opinion, all the others affirmed unanimously that Galen was right. The report of the discussion covers forty pages in Puteus' book and it reminds one of Galileo who a hundred years later in the Dialogue on "Two new sciences," recounted the following episode at a dissection. After the dissector had meticulously demonstrated on the cadaver the origin of the nerves in the brain, he asked a well-known philosopher who was present: "Are you now convinced that the nerves have their origin in the brain and not in the heart?" The philosopher after some meditation answered, "You have demonstrated everything so clearly and elegantly that, if it were not contradicted by the expressed saying of Aristotle that the nerves arise from the heart, one would necessarily acknowledge that you are right."

Puteus gives us also the list of the important personalities who attended the dissection, among whom we find all representatives of the medical school and many philosophers. We must believe, if Puteus is correct in his report, that Vesalius' teaching had not met with great success in Bologna where the Galenists were dominant and the philosophers had a great influence in the medical school. We know from Vesalius how much he hated these empty discussions which had no other aim than to give to some vain people the opportunity of showing off their learning and their florid rhetoric.

The report of the discussion at Bologna and the names of the personalities that were present should have emphasized Puteus' assertions. Considering the general tendencies of the universities at that time, when theoretical discussion with long classical quotations was always believed to be more decisive than experiments, Puteus' belief may be explained. But he was not aware that while Galenism was still definitely in great favor among the philosophers and the theoretical teachers it was already condemned by the anatomists whom he had quoted as witnesses and who may have formally bowed to Galen with respect, in the prefaces of their books and in their lectures, but had accepted in fact the teachings of Vesalius.

Gabriel Cuneus

Gabriel Cuneus, a well-known anatomist who had taught anatomy in Milan and was teaching at the time in Pavia, where he had the chair of anatomy from 1554 to 1574, took his stand. He had been selected as witness by Puteus and answered his call with a direct address to Puteus, which is written in a no less violent language

than that used by Puteus himself. The attack is frank and open; the desire of Cuneus to deny any association with Vesalius' enemies is evident:

Not merely solicitations from those who attend my anatomical lectures at Milan and Pavia, but indeed letters from many physicians of the Sub-alpine school urgently request me to signify to you the exceeding infamy of your *Apologia* for Galen, against Vesalius. On the other hand, in your writing, you earnestly invite the verdict of Gabriel Fallopius, Joannes Cananus, Petrus Martyr Tronus, and of myself, saying that you appoint us as critics of your efforts and beliefs, and that you are willing completely to accept our judgment, which we base upon daily public and private dissections. Before Fallopius died last year, to the great loss of students, surely he made his attitude clear to everybody, in his published Anatomical Observations. For, in the estimation of all those who were present at his dissections and to whom he revealed his concepts, he openly attests that his assent to the opinion of Vesalius is just and reasonable, not only in regard to certain points, but in regard to the majority of those things which Vesalius felt were wanting in Galen. Fallopius writes that Cananus is of the same opinion as he himself; moreover, Cananus very frequently enjoyed an intimate acquaintance with Vesalius, and the two have similar ideas on dissecting and teaching. Not only do all of these facts prove you

GABRIELIS CVNEI
MEDIOLANENSIS,
APOLOGIAE
FRANCISCI PVTEI
PRO GALENO IN ANATOME,
EXAMEN.
Cum Privilegio.



VENEIIIS,
Apud Franciscum de Francis Senensem,
M D LXIIII.

Title-page of Cuneus' *Examen* of Puteus' attack on Vesalius issued at Venice in 1564. This is a handsomely printed quarto in format, nearly twice the size of the Puteus.

wrong, but furthermore, it is most evident to me that the same opinion as that of Fallopius is held by Tronus, my friend and fellow citizen, and by all those I know who are not devoted to books alone, but who undertake anatomy.

Aside from your scurrilous raillery and all your madness, I shall now disclose your shameful and ridiculous compliance with Antonius Fossanus'

jealousy of Vesalius (although obviously, at the court of Emperor Charles and of King Philip, Vesalius mitigated to a great extent the habitual accusation of Fossanus) and the revelation of your ignorance which you display to all in your censure of Vesalius, and your senseless attack on the art to which you never have set your hand. For, although we are under the greatest obligation to Galen, the common preceptor of all, still it does not behoove us to have such devotion for him that we must submit to him rather than to the truth and to the works of God, whenever it is clear that he has incorrectly or falsely described the structure of the human body. By Hercules, it was a bold deed, and a great one, to disclose to physicians and to the entire world that Galen (who, until our times, was believed never to have made the slightest error in anatomy) had never dissected a human body soon after death; and that if, perhaps, he had casually observed human bones, yet what he described were the bones of apes rather than of man. Vesalius was the first to propose this paradox, to the very great envy and perturbation of mind of physicians older than himself. (pp. 3-4)

Not less decided is the defence by Cuneus against Sylvius:

When Sylvius, whom you mention on this occasion, was almost in the grave, and had acquired a great reputation in the art, he had convinced himself that nothing except the complete truth could be found in Galen. Hence he was seriously perturbed at the writing of Vesalius, who for three years had been his most devoted disciple and diligent student. Many people taunted Sylvius because of these writings, and certain physicians of the Emperor Charles, elderly colleagues of Vesalius who were jealous of his youth, added fuel to the fire of Sylvius' rancour.

At this time Sylvius first wrote his commentary on Galen's book *De Ossibus*, and publicly stated that the principal reason for his zeal in this undertaking was his desire to prevent the minds of students from being infected by the heresy of Vesalius (which, to his deep grief, already had invaded a good part of Italy, Germany, and France). In this commentary, Sylvius asserted that, in whatever books it was presented, Galen's entire doctrine on the bones and on all the other parts pertained only to men, and not to apes or to other brutes in regard to certain parts. In his desire to vindicate Galen against the calumnies of Vesalius, Sylvius next published, to the great, but fruitless, expectation of many people, a defense against the accusations of Vesalius. Since by this time he had become slightly more skilled, he said that Galen's books *De Ossibus* and *De Administrandis Dissectionibus*, were indeed written about apes, and not about men, but that the *De Usu Partium* described only the structure of men, and not that of apes. Furthermore, in his extreme old age, with the most profound grief and the most complete perturbation of mind, he undertook dissections very diligently; and, instructed by his own disciples, he left, when he was dying, an introduction

to anatomy. In this he included many things which Vesalius had found wanting in Galen; these were consistent with a true and faithful account, but often were contrary to the opinion of Galen. He also composed a very long preface to this book, and in it he made a zealous but thoroughly ridiculous attempt to show everybody that in the time of Galen men had a different structure than in our time, and that, as a result, there is no cause for astonishment if Galen differed frequently from the description of our parts. In this way, therefore, Sylvius reveals just how much power truth possesses over a violently enraged and self-tormenting mind. (pp. 44-45)

When we examine the argument of Cuneus we have to recognize that he is not very original from the scientific point of view and that the book makes no contribution to anatomical research. Cuneus leans more on Vesalius' text than on his personal experience of which, however, he boasts, affirming that he had the opportunity to practise dissections on the cadavers of German and Swiss soldiers. But most of his descriptions clearly follow only the authority of Vesalius and in some places misinterpret him, for instance, in the discussion about the cavities of the brain, which is very superficial and in which he tries to save Galen's position. That even Cuneus who takes his stand emphatically against Puteus in defence of Vesalius tries in part to save Galen's authority affords another proof that the veneration for the classical teacher still persisted and even those who were convinced of his mistakes did not dare to express their opinion as courageously as Vesalius had done.

On the whole, the book of Cuneus is first of all a courageous personal protest against the insinuation of Puteus who had quoted him as an adversary of Vesalius and whose insolent attacks against the author of the *Fabrica* had surely aroused the indignation of all who were able to appreciate Vesalius' work.

The text of Cuneus is dated Milan, March 26, 1563, one year before Vesalius' visit to Venice. The book was published in 1564, contemporaneously with the *Examen* of Vesalius and by the same publisher. It is interesting to note that, as Harvey Cushing first observed, all extant copies are in the original vellum with Vesalius' *Examen*; this proves that the publisher intended these two books to be closely connected and to be sold together. Less easy to explain is the fact that Puteus' book, at least in all the copies I have seen, including Dr. Fulton's copy, is also bound in the original vellum together with Fallopius' *Observationes*, notwithstanding the fact that the two books were published by different printers and at different

times. It may be assumed that Franciscus de Portonariis, who printed Puteus' book in 1562, may have acquired a stock of Fallopius' *Observationes*, which after the death of the author could not so easily be sold, and had bound the books together in order to give Cuneus' book greater importance.

It is quite evident that Cuneus had exact knowledge of Vesalius' *Examen*. In fact, he often quotes (pp. 13, 21, 39, and 73) some passages from it. How he could have seen the *Examen*, that is, the letter which Vesalius had prepared and sent to Fallopius in 1561 as an answer to the latter's *Observationes*, is not clear. The letter had been consigned to Paolo Tiepolo, the Venetian ambassador in Madrid, who was starting for Venice. However, he was delayed in his journey and when he arrived in Venice Fallopius was dead. It appears likely that Cuneus had the opportunity of reading a copy of Vesalius' manuscript which was dated Dec. 1561. Another hypothesis, submitted by Roth, is that the printer who had seen Vesalius in Venice on his way to the Holy Land, and had obtained from him (1564) Tiepolo's manuscript and the permission to print the *Examen*, may have given it to Cuneus. This is less acceptable, because in March 1563 the book seems to have been completed. Franciscus Senensis, who was on good terms with many friends of Vesalius and later published the 4th (and his sons the 5th) Latin edition of the *Fabrica*, may have heard of Cuneus' intention to prepare an answer to the book of Puteus which had aroused great indignation in Italy, or may have suggested this work and published it, probably with the direct or indirect approval of Vesalius.

Roth has examined in a very exhaustive way the reason why the suggestion of Cardanus that Vesalius himself was the author of the book which appeared under Cuneus' name is not believable. Cardanus, as we know from many other facts of his life, was a great scientist but not very dependable. He never was in personal relationship with Vesalius, having left Padua where he had many enemies long before Vesalius' arrival. A passionate astrologer, who was condemned by the Inquisition for having cast the horoscope of Jesus Christ, he made and published that of Vesalius with some changes, as we can see by comparing the manuscript horoscope, which is preserved in the library of Dr. Friedenwald in Baltimore and was surely the earliest version, with the one printed in Cardan's *Libelli Quinque*, 1547. He boasted of Vesalius' friendship because of the recommendations he had received from him to the Court of the King of Denmark, though this statement seems very doubtful. Cardanus

tells of having been invited to become court physician to the Emperor and to the King of France, as well as to the King of Denmark, but he did not accept any of these alleged invitations. He says that he did not go to Denmark because of the different religion of the court, which he believed would create great difficulties. In fact, we have no proof of the alleged friendship of Vesalius for Cardanus.

In Cuneus' book there is a passage addressed to Puteus which reads: "You heap abuse on the best and most learned men, who are no less excellent mathematicians than they are the most praiseworthy physicians of our age. For, not to mention Fernel Gallus of France, the preceptor of Vesalius, does not Jerome Cardanus, that most brilliant ornament of our country, live here, does not the most celebrated Achilles Gasserus practise the medical art in Germany, and in Belgium is it not practised by Gemma Phrisius and Antonius Gogavinus, who, with countless other physicians, adorn mathematics with their writings, and who daily bring increasing luster to mathematics as well as to medicine?" (p. 71)

This passage was referred to by Cardan in his autobiography *De Propria Vita* (first published in Paris, 1643, nearly seventy years after his death) among the testimonies from illustrious authors. Vesalius is quoted as follows: "Andreas Vesalius in apologia contra Puteum sed sub titulo Gabrielis filii Zachariae." The indication is vague, and the title of the book is incorrect; the name of Cuneus is omitted and the words *sub titulo* are not necessarily expected to mean *under the name*, but *under the title* of the book. Others among the quotations which I have tried to identify are equally inexact. It appears evident that Cardan or the editor of the *De Propria Vita* found the name of Vesalius much more authoritative than that of Cuneus. Thus is explained the inexact indication which induced Boerhaave and Albinus,* and also Haller, to believe that Cuneus was merely a pseudonym for Vesalius—a belief which today appears to be quite unjustified.

The contest between Puteus and Cuneus is the last violent episode of the great conflict which was originated by the *Fabrica*. It cannot be said that Galenism was then definitely defeated. We know that until the end of the 17th century Galenists retained their blind belief in the doctrine of the teacher, but this belief became purely literary and theoretical. Nobody tried to prove Galen's assertions, nor to

* Boerhaave judged Cardan severely with his dictum: "No one wiser when he knew; no one sillier when he erred."

confute the new doctrine with experiments. Fierce rhetorical contests between admirers of one or the other great school were very common, especially in Italy, and were fought sometimes with bloody weapons. I refer to the contests and the duels about Petrarch, and especially in the 16th century the frequent and violent disputes between the supporters of Ariosto and the admirers of Tasso. After one of these duels it is said that a loser exclaimed as he expired: "It is terrible to think that I have never read either of them!" This is somewhat the case in the fierce conflict between Arabists, Galenists, and anti-Galenists in the Renaissance. Many of them had perchance read, but often had not understood either of the authors for whom they were fighting. The conflict was one of the culminating events in the Renaissance struggle between the principle of blind obedience to scholastic authority and the need for free, independent criticism. The day of the issue of the *Fabrica* marks the historical date of a great and victorious battle.

DR. FRANCIS: Our good friend and spiritual standby, the Rev. Dr. George Stewart, can put more meat into a prayer than most of us can get into a speech. Before leaving this room I hope that those of you who have not already noted it, will read the learned, wise, and poetically beautiful inscription composed by him and carved on its lordly mantelpiece. Dr. Stewart will dismiss us with the Benediction.

BENEDICTION
THE REVEREND GEORGE STEWART



ORD, amid the air of ancient books
Expressing the thought of other times
But revealing the same faith and enquiring
mind
Of those of our day
Who bless mankind with their research
We offer our thanks for Andreas of Wesel.

We bless Thee for the goodly heritage
From which he sprang,
For youthful curiosity
That fathered the genius of mature years,
For his knowledge of the Latin tongue
Even if neglected in the stagnant air of courts,
For his hospitality to Arab learning,
For all he learned from
Avicenna, Lazarus Hebraeus, Rhazes, and Galen,
And most of all, for what he added to their lore,
For his mind's triumph over the
Pedantry of Jacques Dubois,
His refusal of untruth
Clad in ancient dignities,
For midnight visits to the forbidden dead,
For his enthusiasm
Communicated to fellow students,
For friendship with Guinterius and Gemma Frisius,
For labors as a physician in the wars,
His years of teaching at Padua, Pisa, and Bologna,
And for encouragement from Mark Antony Giunta
And Wolfgang Herwart.

THOU Who dost so often help those who work together
In the service of Thy children,
We thank Thee for Calcar, Stephanus, Stopius and
Oporinus,

For friendship with printers and artists,
Thus learning
By new modes to immortalize
The teachers' skill
And the pioneers' discovery.

Now, when the cup of learning
Seemeth to the young to be over full,
Make them restless
With the spirit of the great
Investigators of the past,
That men may walk the earth in health
And bless one another
With healing and with wit.

Nor can we at such an hour,
Forget Thy son, Harvey Cushing,
Whose hope and faith and gifts
Began this noble seat of learning.

Let not this place be the cemetery of perished thought
But here, in resurrection,
May the dead stand forth
To give the valor of their minds
To generations yet unborn.

As we close our exercise of memory
Remember all who follow the
Art and the science of healing
Throughout the earth.

Upon friend and upon enemy alike
We ask Thy favor, Lord,
That, when war's red day is past and gone,
Together we may labor
In unity of the spirit
And in the bond of peace.

Through Jesus Christ, Our Lord. Amen.

VESALIUS EXHIBIT

AN EXHIBIT ARRANGED AT THE YALE MEDICAL
LIBRARY TO COMMEMORATE THE 400TH YEAR
OF PUBLICATION OF ANDREAS VESALIUS'
*DE HUMANI CORPORIS FABRICA**

Since Dr. Cushing's Vesalian collection is very extensive (see *The Harvey Cushing Collection of Books and Manuscripts*, 1943, pp. 189-190), it was possible to display only a small proportion of the materials. The exhibition has aroused considerable interest both in the School and outside, and it has therefore seemed fitting to make some record of the items shown.

IN THE CUSHING ROTUNDA

CASE I. *PRE-VESALIAN ANATOMY*. On display in the first case were four illustrations of the human skeleton executed prior to the time of Vesalius.

(1) *A XVth century Persian MS.* Tashrīh al-'Abdān (Anatomy of the Human Body) by Mansūr Fakīh' Ilyās, with six anatomical illustrations and opened to that of the skeleton, was exhibited through the kindness of Dr. A. S. Yahuda. The text was composed for a grandson of Tamerlan, and the MS. itself dates from around 1480.

(2) *Magnus Hundt's 'Antropologium'*. The so-called Hela skeleton which appeared in Magnus Hundt's *Antropologium*, Leipzig, 1501, is printed as a large folding broadside inserted after folio E4 and carries the title *Anathomia Ossium totius humani Corporis*. This is one of the most primitive of the early skeletons, many of its details being copied from the schematized drawings encountered in earlier Persian and Chinese MS. sources.

(3) *Phryesen's 'Spiegel der Artzney'*. The 1517 skeleton from Phryesen is an awkward, highly conventionalized drawing which was frequently reproduced in medical works prior to 1538. It stands in striking contrast to the skeletal figures of the Vesalian *Tabulae sex*.

*Arranged by the staff of the Historical Library. Numbers in parenthesis after individual editions cited herein refer to the entries in the Cushing *Bio-bibliography of Vesalius*, 1943, just published under the auspices of the Historical Library by Schuman's of New York.



(4) *The Balamio skeletons*. Much more creditable anatomically were the skeletal figures used by Cardinal Balamio to illustrate Galen's *De ossibus* issued at Lyons in 1535. Vesalius himself negotiated publication of another edition of the Balamio Galen in 1538, but omitted the skeletal figures (see Dr. Cushing's *Bio-bibliography of Vesalius*, 1943 (p. 48).

CASE II. *THE 'TABULÆ SEX'*. The first Vesalian skeletons appeared as Tables 4-6 of the *Tabulæ anatomicæ [sex]* issued in 1538 (II. 1 [A]), shortly after Vesalius at the age of 23 had been appointed Professor of Surgery at Padua. They were produced in collaboration with the artist, Jan van Calcar. A reproduction of the Six Tables was shown from a recent publication of the New York Academy of Medicine issued under the title *Icones anatomicæ* (VI. A. 16, p. 107).

(1) *Icones anatomicæ*. This was opened to the skeletal plates 4-5 of the *Tabulæ sex*. Attention was drawn to certain imperfections such as the slope of the pelvis, the ankle articulation, and the delineation of the clavicles; but it was pointed out that they represented, when compared with the pre-Vesalian skeletons, a new era in anatomical illustration.

(2) *The Jobst de Necker plagiaries*. The rare originals of the venous and arterial plates of the Jobst de Necker plagiarism (II. 5) of the *Tabulæ sex* were displayed with the skeletal figures.

CASE III. *EARLY WRITINGS*. This case contained examples of Vesalius' early miscellaneous writings, as follows:

(1) *The 'Paraphrasis'*. A photograph of the title-page of Dr. Erik Waller's copy of the rare Louvain edition of Vesalius' Paraphrase of the Ninth Book of Rhazes, issued by Rutger Resch in February 1537 (I. 1) was exhibited beside Dr. Cushing's copy of the Basel edition of March 1537 (I. 2). As a student at Louvain and Paris, Vesalius at the age of 22 translated from the Arabic the 9th book of Rhazes, giving a free rendering that caused him to use the designation 'Paraphrase'. It is not known when Vesalius learned Arabic, but it is clear that he had a fair comprehension of that tongue. Although prepared as a dissertation for a degree, there is no record that Vesalius received an advanced degree from Louvain. A copy of Rhazes' *Opera exquisitoria* issued at Basel in 1544 was also on

display, opened to folio S4b to show the third edition of Vesalius' *Paraphrasis* (I. 3, p. 8).

(2) *Guenther's 'Institutiones anatomicæ'*. The original edition of Guenther's Institutes issued in 1536 was opened to page 46 on which occurs the first published reference to the young Vesalius, then aged 21. He here receives commendatory mention for his dissection of the spermatic vessels (see *Bio-bibliography*, p. 44). At the age of 23, Vesalius, following his appointment at Padua, edited and published a new edition of Guenther's Institutes (III. 1, p. 47). This was also displayed along with the undated edition issued at Venice, probably in 1540 (III. 2, p. 48).

(3) *The Venesection Epistle*. In 1539 Vesalius plunged into the controversy on blood-letting which was then occupying many of the best minds in Continental medicine. The greater circulation had not then been discovered, and the controversy turned on the site and side from which blood should be drawn in cases of pneumonia and other affections of the lungs. Vesalius was familiar, through his own dissections, with the anatomy of the azygos vein, and since this drained the intercostal spaces he argued that blood should be drawn from the right side. The editions of 1539 and 1544 of the Epistle were exhibited (IV. 1 and 2, p. 58).

(4) *Vesalius' translations of Galen*. After Vesalius issued his *Tabulæ sex* he was called upon by Gadaldinus to translate from Greek into Latin three important books of Galen:

- (a) *Galenī de nervorum dissectione liber*
- (b) *Galenī de venarum arteriarumque dissectione liber*
- (c) *Galenī de anatomicis administrationibus libri novem*

They first appeared in 1541 in the collected *Opera omnia* of Galen issued by the celebrated press of Giunta at Venice. The volume containing these translations was exhibited (V. 1, p. 65).

CASE IV. *THE 'EPITOME'*. Realizing that artists and probably also certain students of medicine and surgery would not need the detailed printed text of the *Fabrica* itself, Vesalius issued, almost simultaneously with his *magnum opus*, a 14-page 'epitome' (VI. B. 1) containing certain of the figures from the *Fabrica* with explanatory legends, and also several larger muscle figures too big for the format eventually adopted for the *Fabrica* itself.

(1) *Dr. Cushing's first copy*. This, the smaller of the two copies, was opened at folios Ib-Ka showing on Ib one of the large

muscle figures not used in the *Fabrica* and on Ka the plate of the famous 'thinking skeleton' which also appeared in the *Fabrica* itself. Anatomically and artistically this represented a vast improvement upon the skeletal figures of the *Tabulæ sex* (Case II).

(2) *Dr. Cushing's second copy.* This, one of the largest copies of the *Epitome* in existence, measuring 56.5 by 40.5 cm., was opened at the engraved title which shows, among other things, a particularly clear impression of Stephan van Calcar, sketch-book in hand; and on the covers of the sketch-book the initials, 'S.C.', are clearly visible, more so than in the *Fabrica* frontispiece where the letters tend to be less distinct. This suggests that the engraved frontispiece was used first for the *Epitome* and afterwards for printing the *Fabrica*. Both books were published at Basel in June of 1543.

(3) *The German 'Epitome'.* A copy of the German *Epitome*, issued in August of 1543, was opened to show the engraved frontispiece. Although the same wood-block had been used as in the Latin *Epitome*, the initials on Calcar's sketch-book are much less distinct. The translation was made by the Rector of Basel, Albanus Torinus (see Dr. Henry Sigerist's paper on Torinus in the *Bulletin of the History of Medicine*, December 1943 [X. 448]).

CASE V. *THE 'FABRICA'.* At the age of 28 Vesalius issued his monumental treatise, *De humani corporis fabrica* (VI. A. 1, p. 79). The first four editions were exhibited, as follows:

(1) *The 1543 'Fabrica'.* The Joseph Marshall Flint copy of the 1543 *Fabrica*, recently acquired by the Historical Library as a gift from Dr. Flint, is the most perfect of our three copies of the first edition. It was displayed opened to the engraved title. A reproduction of the portrait of Vesalius was placed opposite.

(2) *The 1555 'Fabrica'.* Dr. Cushing's copy was exhibited, also opened to show the engraved title (VI. A. 3, p. 91). The case included a photograph from Dr. Willy Wiegand of the two original wood-blocks of the engraved titles of the 1543 and 1555 editions placed side by side in the same printer's frame at the Bremer Presse, Munich, where they both had been brought in 1933 for the printing of the New York Academy *Icones*.

(3) *The 1552 'Fabrica'.* The rare, two-volume, 16mo edition of the *Fabrica* published without illustrations at Lyons was also included (VI. A. 2, p. 89).

(4) *The 1568 'Fabrica'*. The posthumous edition issued at Venice (VI. A. 4, p. 92) was exhibited; it is believed that certain textual changes made by Vesalius prior to his trip to the Holy Land in 1564 had been incorporated. Attention was drawn to the translation of the word *Fabrica* itself, it being pointed out that as used by Vesalius it really implied the 'works' or 'workings' of the body and that a suitable translation of the title of the Vesalian anatomy would therefore be "On Man's Bodily Workings."

(5) *The Vesalian muscle-men*. On the wall immediately behind Case V were shown the famous illustrations of the muscle-men from the *Fabrica*—the so-called "8-series" and "6-series" mounted in sequence to show the continuous landscape background. Apart from the engraved title of the *Fabrica*, the greatest *tour de force* of the book lies in this sequence of muscle plates. In 1934, after the original wood-blocks had been discovered (by the late Leonard L. Mackall), the New York Academy of Medicine in co-operation with Dr. Wiegand had a number of sets of the muscle-men arranged in sequence to show the continuous landscape background, recently identified by the late Professor Putti of Bologna as that of the Euganean Hills near Padua. A sufficient number of the old landmarks were still standing a few years ago to make possible this positive identification. It is probable that the muscle-men were designed by Calcar.

Special note. The Historical Library offered a prize to the medical student who detected the greatest number of anatomical errors in these celebrated figures. Announcement of the winners is given below at the end of this account of the exhibit.

CASE VI. *THE GEMINUS VESALIUS*. In 1545, only two years after the publication of the *Fabrica*, Thomas Geminus brought out in London a sumptuous anatomical text, the *Compendiosa totius anatomie delineatio* (VI. C. 2, p. 122), in which the Vesalian wood-blocks were beautifully rendered in copperplates. As text he had used the Latin *Epitome*, but in 1553 he issued an English edition (VI. C. 3, p. 126) and had the legends of the *Fabrica* translated (the first rendering of any part of Vesalius into English); as text for the English edition he used, not Vesalius, but, as Colonel Larkey first discovered, the anatomical text of the Englishman, Thomas Vicary's *Anatomie of the bodie of man*. The second

English edition appeared in 1559 (VI. C. 4, p. 128) and was dedicated to Queen Elizabeth who had just ascended the throne.

(1) *The 1545 'Compendiosa'.* The original Latin edition of Geminus issued at London in 1545 was opened to display the elaborately engraved title. This copperplate engraving and those of the 42 Geminus figures, most of which are taken directly from Vesalius, were probably the first copperplates in the history of the British printed book. Geminus, the publisher and engraver, had evidently learned the new technique on the Continent and had brought it to England about 1544.

(2) *The 1553 English Geminus.* The first English translation of Geminus was also shown, open to the third skeletal plate. The explanations of the figures, as pointed out above, are Englished directly from the legends of the *Fabrica*.

(3) *The 1559 English Geminus.* This was opened to plate 9 showing the superimposition of the systemic arteries and veins, also the vasculature of the pelvic viscera.

(4) *The Grévin Geminus.* In 1559 the French humanist, Jacques Grévin, aged 22, appeared in London and became a protégé of the young Queen Elizabeth, then aged 26. It is probable that Grévin met Geminus, for on returning to France he made off with all the copperplates of the *Compendiosa* and shortly thereafter brought out Latin (1564 and 1565) and later (1569) French editions of Geminus, all with the original Geminus copperplates. The Latin edition of 1565 which bears the title, *Anatomes totius, ære insculpta delineatio, cui addita est epitome . . . de corporis humani fabrica conscripsit clariss. And. Vesalius*, was on display.

IN THE ENTRANCE ALCOVES

CASE VII. *LATER WRITINGS OF VESALIUS.* Following the publication of the *Fabrica*, Vesalius returned to Padua, but because of adverse criticism that had come to him from the Church and the entrenched Galenists he, in a fit of temper, burned all of his unfinished MSS. and fled the city. For some months thereafter he occupied his time by following the armies of Charles V as a military surgeon. A number of miscellaneous writings appeared in the years that followed, the first of which was the China-root Epistle.

(1) *The China-root Epistle.* In 1544 Vesalius had become per-

sonal physician to his emperor, Charles V, and he accompanied his monarch as a military surgeon on his campaigns into the Valley of the Marne where he met the forces of Francis I at points such as Soissons and Château Thierry. In 1546 Vesalius' celebrated China-root Epistle was issued by his brother, Franciscus. It takes the form of a letter addressed to his physician-friend, Joachim Roelants, and was written in response to a request for his experience with the new decoction of *Smilax China*, thought to be effective in curing sundry infectious ailments including Charles' imperial "arthritis" (? gout). The book is particularly important biographically since it gives intimate details concerning Vesalius' early life; indeed it is the chief source of information concerning the years prior to 1545.

The editions exhibited were: the first, of Basel, 1546; the second, of Venice (1546?), and the third, of Lyons, 1547 (VII. 1, 2, 3, pp. 163-4). The last was opened to S7b-8a to show the *Regimento* here translated into French.

(2) *Reply to Fallopius*. In 1561 Fallopius had published his *Observationes anatomicæ* in which he corrected a number of errors in the *Fabrica* and extended descriptions that were incomplete. Vesalius wrote a friendly letter to him after reading the book and gave it to Tiepolo, the Venetian Ambassador at the Spanish Court, to deliver on his return home. Unfortunately Fallopius had died before the letter could be delivered. The printer, Franciscus de Franciscis, later obtained the letter from Tiepolo and printed it (IX. 1, p. 195) while Vesalius was on a trip to the Holy Land—a trip, as legend has it, undertaken in penance for having done an autopsy on a body not yet dead (the heart gave a beat as the thorax was opened). Vesalius died without seeing this, his last published work, for in 1564 he was shipwrecked on the Island of Zante and was buried there.

Exhibited with the Reply to Fallopius were the rare volumes of Puteus and Cuneus discussed by Dr. Castiglioni at the anniversary celebration: (1) *Apologia in anatome contra Andreæ Vessalii Bruxellensis, Francisci Puteo Medico Vercellensi Authore. Venetiis, apud Franciscum de Portonariis, de Tridino, 1562*. (2) *Gabrielis Cunei Mediolanensis, apologiæ, Francisci Putei pro Galeno in anatome, examen. Venetiis, apud Franciscum de Franciscis Senensem, 1564*.

(3) *The Vesalian 'Consilia'*. In the XVIth century it was the practice of physicians, and also of laymen, to request written opinions

concerning individual patients. Such "consultations" were often conducted at long range, the case history being submitted to the consultant and he in turn sending back a written reply—or *consilium*. There is a large literature of such *consilia*, often printed many years later without the knowledge of the author, often after his death. They were sometimes published in collections of writings by different consultants; at the time they played the rôle that clinical reports have in the medical literature of to-day.

(a) '*Consilium*' for the Duke of Terranova. The most famous of Vesalius' *consilia* was published in Ingrassia's *Quæstio de purgatione . . . de sanguinis missione* [etc.], Venice, 1568 (VIII. C, p. 174). In a jousting contest the Duke had had his chest pierced by his opponent's spear and developed an empyema. In reply to Ingrassia's request, Vesalius gave cogent advice which suggests that he was himself a skilled thoracic surgeon.

(b) '*Consilium*' in Garetius. Extracts from various Vesalian letters, unfortunately undated, are found (pp. 122-125) in Garetius' compilation on gout: *De arthritidis præservatione et curatione . . . consilia*, Frankfurt, 1592 (VIII. E, p. 177). They are addressed to I. D. Pratensis (Louis de Flandre, Seigneur de Praet, Minister of Charles V), and are on a variety of cases, some of them giving accounts of operations performed by Vesalius in cases of abscess.

CASE VIII. *VESALIANA*. Here were arranged the two principal biographies of Vesalius, proof-sheets of the forthcoming *Bio-bibliography* by Dr. Cushing, the Jouvenel medal, and an example of Vesalius' handwriting from the letter to Heinrich Petri, preserved in the Library at Basel and reproduced in Roth and Schmidt's *Handschriftenproben zur Basler Geistesgeschichte des 15. und 16. Jahrhunderts ausgewählt, transcribiert, übersetzt und erläutert*, Basel, 1926 (f. 22).

(1) *The Roth Biography*. The chief biography of Vesalius is that of Moritz Roth, the scholarly professor of anatomy at Basel, whose fully documented *Andreas Vesalius Bruxellensis* (1892) has long remained a classic of medical biography (X. 345). Dr. Cushing has stated that in writing his *Life of Sir William Osler* Roth influenced him perhaps more than any other biographer save Henry Festing Jones and his *Samuel Butler*.

(2) *The Burgræve Biography*. Prior to the advent of Roth,

Burggraeve's *Etudes sur André Vésale* (X. 62) held the field. Burggraeve was a Belgian and had access to many source-materials which have since been destroyed in the Library at Louvain (in 1914).

(3) *Anatomy in Long Clothes*. One of the most attractive biographical essays in our medical literature is Henry Morley's account of Vesalius published under the picturesque title, 'Anatomy in Long Clothes', which first appeared in *Fraser's Magazine* for 1853 (X. 295). This has been several times reprinted.

(4) *Spielmann's Iconography*. Dr. Spielmann's exhaustive study of the paintings, pictures, engravings, illustrations, sculpture and medals relating to Vesalius which was issued in 1925 (X. 371) contains, among other things, a detailed description of the portrait of Vesalius reproduced as the frontispiece of this volume. The portrait, attributed to Calcar, had been acquired by Dr. Cushing in 1920.

(5) *Dr. Cushing's Bio-bibliography of Vesalius*. For some 40 years Dr. Cushing had collected the writings of Vesalius, as well as the works of many of his less gifted followers. It had been Dr. Cushing's intention to prepare a full-length bibliography of Vesalius and he was hard at work on the book at the time of his death. With the co-operation of Dr. W. W. Francis, Librarian of the Osler Library, Professor Arturo Castiglioni of our Historical Library, and Dr. Edward C. Streeter, Curator of our Museum Collections, it has been possible for the Historical Library to complete the *Bio-bibliography* in time for publication in the 400th anniversary year of 1943.

(6) *The Jouvenel Medal, ca. 1846*. On the obverse is a portrait bust of Vesalius in profile with the inscription: "André Vésale ne [*sic*] en 1514 mort en 1564." On the reverse appears the legend: "Il fut le père de l'anatomie. 1537, après avoir étudié et avoir obtenu les plus beaux succès à Montpellier, à Paris, à Louvain, à Padoue et à Venise. Il professa l'anatomie et la chirurgie à l'Université de Padoue, il y composa son magnifique ouvrage sur l'anatomie du corps humain. Ayant quitté la cour de Madrid où il ne se plaisait point, il mourut à Zante où les vents contraires l'avaient jeté" (see Spielmann, 1925, p. 211 [X. 371]).

(7) *The Vesalius MS*. This has been described in the general note above.

IN THE HISTORICAL LIBRARY

ON TABLE AT RIGHT OF ENTRANCE. *HISTORY OF VASCULAR ILLUSTRATION*. Although crude blood-letting diagrams have come down to us both from the Chinese and the Arabians, the first serious attempt to portray the vascular system was that of Vesalius in the first three plates of the *Tabulæ sex* (1538). Plate II gives an independent diagram of the venous system, and Plate III of the arterial; both show the vessels unassociated with the human body itself (from the Stirling-Maxwell facsimile of the *Tabulæ sex* (II. 2[B], p. 14).

(1) *Walter Ryff's Plagiaries*. The unsuppressible Ryff whom Vesalius inveighs against (in his Preface to the *Fabrica*) and whom Leonard Fuchs so strongly blamed—"of all men the sun has seen, the most shameless"—had issued a series of anatomical and surgical works with plates drawn from the *Tabulæ sex* without even a shadow of acknowledgment. He had the original idea, however, of placing the Vesalian venous and arterial systems on semi-crouching human figures, thus giving a first approximation of vascular relations with the rest of the body. The venous and the arterial figures, however, were still kept separate. Exhibited were the *Anatomi*, one copy, fol. xlva, second copy, fol. xxvb [II. 9]; *Die Kleyner Chirurgi*, 1542, fol. xxib [II. 13], and the *Anatomica* (French), 1545, fol. 12a [II. 18].

(2) *Charles Estienne and Estienne Rivière*. In the famous anatomy of Charles Estienne and Estienne Rivière the arterial and venous systems were for the first time superimposed in a human figure, thus giving what might have been a real clue to the circulation. In the figure on page 134 of the Latin edition of 1545 (page 135 of the French edition of 1546) one sees the heart giving origin to the aorta which branches and courses separately in thorax and abdomen beside the vena cava. This famous plate is thus a most important anatomical forerunner of Fabricius and Harvey. In the *Fabrica* the venous and arterial systems remain largely separate, and they continued so to dwell separately in the minds of men until the advent of William Harvey.

IN FIRST ALCOVE AT RIGHT: *VESALIAN EXHIBIT FOR ARTISTS*. Being a product of the Renaissance, Vesalius was intimately associated with the artists of his time and he made a special effort to meet their needs in issuing the *Epitome*; but the *Epitome*

became rare and later generations of artists, discovering the quality of the Vesalian plates, adapted them for the needs of the studio. Most notable of these "adaptations" were those of van der Gracht, Torteбат, Bonavera and Moro, all of which were represented in the present exhibit.

(1) *Van der Gracht's original drawings*. In 1928 Dr. Cushing obtained from Menno Hertzberger of Amsterdam a set of the original drawings of Jacob van der Gracht (VI. D. 16, p. 137) which he had adapted from the figures of the *Epitome* and the *Fabrica*. They are sixteen in number and are beautifully executed in red pastel (muscles) with bones in grey and black, all in excellent three-dimensional perspective. The coloured plates were evidently too much for the engravers, and they eventually were reproduced as simple uncoloured copperplates (see below).

(2) *Van der Gracht's 'Anatomie', 1634*. A plate was shown from the first printed edition of the *Anatomie* (VI. D. 17, p. 139) for comparison with the original drawing in the Cushing-van der Gracht MS. The title of the second edition of van der Gracht's *Anatomie*, 1660, was also displayed (VI. D. 18).

(3) *Torteбат's 'Abrégé d'Anatomie', 1667*. At Paris in 1667 one Roger de Piles, who wrote under the pseudonym of François Torteбат, issued a more detailed anatomy for artists, utilizing the muscle-men of the *Fabrica* and the *Epitome*, also the skeletal figures (VI. D. 25, p. 144). The Torteбат evidently achieved great popularity, for it passed through no less than seven editions within the next century. The copy on display was opened to the skeletal figures. Also on display were a German translation of the *Abrégé* (1706) with the plates well executed on copper freshly engraved (VI. D. 26, p. 145); also an edition of 1760 with the plates re-engraved on a smaller format (VI. D. 28).

(4) *Bonavera's 'Notomie di Titiano'*. The belief that the Vesalian plates were executed by Titian persisted into the XVIIIth century and, indeed, well down to the present time. An obscure Italian artist, Domenico Bonavera, helped perpetuate the error by issuing late in the XVIIth century (*ca.* 1670) a selection of the Vesalian skeletons and muscle-men under the name of Titian. The title-page of one copy was shown (VI. D. 9, p. 134); another copy was opened to show one of Bonavera's Vesalian muscle-men.

(5) *Bakewell's 'Abridgment'*. The title-page of an undated XVIIIth century English Anatomy for artists with Vesalian plates

was also exhibited: *An abridgment of Anatomy taken from Titian & other of the best Italian Masters and adapted to the arts of painting and sculpture*. Dedicated to Sir Godfrey Kneller, this 'Abridgment' is really an adaptation in English of the Tortebat and Bonavera brochures, and is evidently based on them (see VI. D. 9, p. 134).

(6) *Moro and Montani's 'Anotomia'*, 1679. A less elaborate undertaking was that of Moro who issued engraved outlines of the Vesalian figures on copper (VI. D. 18A). Little seems to be known concerning either Moro or Montani. Information concerning them will be gratefully received.

FIRST ALCOVE AT RIGHT (PRINT ROOM). *LATER EDITIONS OF VESALIUS*: A selection of the later editions of the *Fabrica* and *Epitome* were arranged on tables in the Print Room off the first alcove and included the following:

(1) Bauman's *Anatomia Deudsch*, Nürnberg, 1551 (VI. D. 4, p. 132).

(2) Bauman's *Anatomia Deudsch*, Nürnberg, 1575 (VI. D. 6, p. 132).

(3) Boerhaave-Albinus *Opera omnia*, Leyden, 1724 (VI. D. 7, p. 133). To secure subscribers a few copies of the text of the *Fabrica*, Books I-IV, were issued in 1724. The two-volume edition with the completed text of the *Fabrica* and certain other Vesalian items was published in 1725.

(4) Boerhaave-Albinus *Opera omnia*, Leyden, 1725, 2 vols. (VI, D. 8, p. 133).

(5) Botter's *Epitome*, Cologne, 1600 (VI. D. 10, p. 135).

(6) Botter's *Epitome*, Amsterdam, 1617 (VI. D. 12, p. 135).

(7) Sandifort's *Tabulæ ossium*, Leyden, 1782 (VI. D. 24, p. 143).

WORKS CONTAINING ORIGINAL WOOD-BLOCKS: Also in the Print Room were the XVIIIth century compilations of Maschenbauer and Leveling in which the original Vesalian wood-blocks had been used—as they were once again in 1934 by the New York Academy of Medicine (see above, Case II). Exhibited were:

(1) Maschenbauer: *Andreae Vesalii Bruxellensis, Dess Ersten, Besten Anatomici, Zergliederung Dess Menschlichen Körpers. Auf Mahlerey und Bildhauer-Kunst gericht. Die Figuren von Titian gezeichnet. Augspurg, gedruckt und verlegt durch Andreas Maschenbauer*, 1706. It is thus interesting that the blocks are here used

in a book specifically directed to artists and that the figures once again are attributed to Titian (VI. A. 12, p. 99).

(2) Maschenbauer: the same as preceding, Augsburg, 1723.

(3) Leveling: *Anatomische Erklärung*, Ingolstadt, 1783 (VI. A. 15, p. 105).

FIRST ALCOVE AT RIGHT (STUDY). *VALVERDE*. The Spanish anatomist, Juan Valverde de Hamusco, issued at Rome in 1556 an anatomical treatise in Spanish in which some 40 plates from the *Fabrica* were reproduced as copper engravings. There were also several new and original plates including one in which the arterial and venous systems were superimposed following the lead of Charles Estienne (see above on evolution of vascular illustration). Valverde was himself plagiarized in turn by the Antwerp printer, Christopher Plantin, in a work issued in 1566 under the title, *Vivæ imagines*.

Dr. Cushing possessed all known editions of Valverde, and all were exhibited as follows:

- | | |
|---|----------------------------------|
| (1) <i>Anatomia</i> (Spanish) | Rome, 1556 (VI, D. 32, p. 146) |
| (2) <i>Anatomia</i> (plates only—for artists) | Rome, 1556 (? 1586) |
| (3) <i>Anatomia</i> (Italian) | Rome, 1559 (VI. D. 35) |
| (4) <i>Anatomia</i> (Italian) | Rome, 1560 (VI. D. 36) |
| (5) <i>Anatomia</i> (Italian) | Venice, 1586 (VI. D. 37) |
| (6) <i>Anatomia</i> (Latin) | Venice, 1589 (VI. D. 38) |
| (7) <i>Anatomia</i> (Italian) | Venice, 1606 (VI. D. 39) |
| (8) <i>Anatomia</i> (Latin) | Venice, 1607 (VI. D. 41) |
| (9) <i>Anatomia</i> (Italian) | Venice, 1608 (VI. D. 40) |
| (10) <i>Anatomia</i> (Italian) | Venice, 1682 (VI. D. 42) |
| (11) <i>Vivæ imagines</i> (Latin) | Antwerp, 1566 (VI. D. 43) |
| (12) <i>Vivæ imagines</i> (Dutch) | Antwerp, 1568 (VI. D. 44) |
| (13) <i>Vivæ imagines</i> (Latin) | Antwerp, 1579(?1572) (VI. D. 45) |
| (14) <i>Vivæ imagines</i> (Dutch) | Amsterdam, 1647 (VI. D. 46) |

The Valverde exhibit was arranged on a table in three rows:

First row: A series of early editions of Valverde's *Anatomy*, including the first Spanish, Italian and Latin renderings. The second item was a special edition of the plates intended for artists (discovered by Dr. Streeter).

Second row: Some of the later editions of Valverde opened to show the plates.

Third row: The *Vivæ imagines* of Plantin with plates plagiarized

from Valverde, including the original Latin and the second Dutch translations. The second item was a copy of the second edition of the Latin *Vivæ imagines* which was presented to Dr. Cushing by Sir William Osler.

VESALIAN ICONOGRAPHY

On the walls of the alcove rooms was arranged a group of some twenty-five representations of Vesalius, including a portrait in oil made for Dr. Cushing in 1909 from the original by Titian (?) in the Pitti Palace, Florence, and a small oil portrait measuring 30 by 20 cm. painted on an old panel, the authenticity of which was doubted by Spielmann. The others were for the most part photographs of portraits thought to be of Vesalius in European galleries—Padua, Düsseldorf, Vienna, Paris, London, Oxford, Glasgow, etc.

* * *

THE VESALIUS PRIZE

The prize offered by the Historical Library for the student who detected the largest number of errors in the "8-series" and the "6-series" of the muscle-men in the *Fabrica* on display in the rotunda of the Medical Library has been awarded jointly to James A. Kleeman and W. J. Wedemeyer, Jr., both of the first-year class. Since they were tied for first place, each having enumerated twenty-one legitimate errors, the Historical Library has pleasure in presenting to each one of them a copy of the *Bio-bibliography of Vesalius*. Honorable mention should be given to Martin E. Gordon who enumerated sixteen errors and Vincent J. Longo who enumerated ten.

A BIO-BIBLIOGRAPHY OF ANDREAS VESALIUS. By Harvey Cushing. Schuman's, New York, 1943. xxxviii + 230 pp. with 90 illustrations. \$15.

The pleasure of the undertaking lies not in reaching Xanadu—I am sure that no true scholar has yet found rest in that fabulous city—but rather in disclosing the road that leads ever onward to that goal. As the author states, such a venture into bibliography is to follow a path which enters "a dark forest full of unsuspected brambles." It is obvious that the brambles but exerted a stimulus, for the search for Vesalian material continued over a period of 40 years. And it is evident that the journey was a pleasant one;

VESALIUS CELEBRATION

deciphering the uncertain signposts by the way, making due count of those posts that mark the miles; perchance retracing many steps to correct a waywardness induced by intriguing circumstances; attaining one objective only to find another ever more forcefully beckoning; these must have been the charms to compensate for so much labor.

For the objective was "to place the published writings of Vesalius in proper relation to those episodes of his life of which there is contemporary record," and this after a lapse of some 400 years. This has been admirably done; out of a wealth of scholarly study, and with more than a trace of sly humor, emerges Vesalius,—the man, his books, and the background of both. A name in the history of medicine becomes human, an everyday sort of person (in many respects) in an everyday world, if chance and mischance heaped the one upon the other can make an everyday world of the period that saw Galenism face a challenge.

The title clearly indicates the double-barrelled nature of the book; it cannot fail to meet the approval of those who choose to focus on the "Bio," while it will give equal satisfaction to those who would emphasize the "Biblio." And for those who appreciate the artistry of fine book-making the volume affords great reward.

—GEO. H. SMITH.

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The anatomical world had become divided into Galenists and Vesalianists. Fallopius's Observationes Anatomicae which pointed out certain errors in the "Fabrica" was addressed ad Petrum Mannam Medicum Cremonensem and was published in Venice in 1561. Vesalius, then in Madrid, received a copy of this from the Brussels physician Aegidius Hertoghe (Dux), and though no material for dissection was at hand he appears to have answered immediately for the Anatomicarum Gabrielis Fallopii Observationum Examen is signed at Madrid on December 27, 1561 'ex aula regia'. The Venetian ambassador, Paulus Teupulus, was entrusted with the deliverance of the MS. but it was delayed and never reached Fallopius who died in 1562, and apparently the MS. remained in Tiepolo's hands. It was not published until three years later, possibly when Vesal passed through Venice on his way to the Holy Land, the publisher's prefatory note being dated from there, May 23, 1564.

Bound in with all intact copies of Vesal's "Examen" in the original vellum covers is this volume by Cuneus the anatomist of Pavia, who had taken up cudgels for Vesalius against Francisco Puzzi a pupil of Sylvius and consequently an out-and-out Galenist who meanwhile had written the following:

Apologia pro Galeno, in Anatomes
examen contra Andream Vesalium
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Vesal might write a dignified reply to Fallopius but this sort of an attack was not for him to answer. It is not impossible that Vesal may have encountered Cuneus on his way across Europe and have taken his "Examen" of Pozzi in manuscript which bears the date March 26, 1563, and have turned it over two months later, together with his own "Examen" of Fallopius to the Venetian publisher, Francesco Sanese. However this may be, the fact remains that they are usually found together. My own copy of Vesal's "Examen" formerly belonging to Caspar Bauhin, was purchased at Rosenthal's in 1907. The Cuneus had been extracted, though its title was present on the old cover. At the San Marco Library in Venice both are to be found in original single covers. It would appear that booksellers are accustomed to separate them, for some months ago I saw both noted and separately priced in some foreign catalogue. I wrote for the Cuneus but missed it. Hence when Davis & Orioli's catalogue, received October 1921, likewise listed them both, I cabled for it, whereas this time E. C. Streeter and the B. M. L. were among those who wrote in vain.

H. C.

I gave the copy to the Lefay Grummers one night when they were here. The copy of the Cuneus which I have had reinserted in the book was purchased separately from Davis and Orioli in 1921. It had been separated from its mate. The annotations as will be seen are not in Bauhin's fine script.

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 copy of the Gurners which they took
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 that in the Gurners' first book.

The following is from Roth's Vesalius":

The writing of Gabriel Cuneus contains a vindication of the Vesalian Anatomy against the attack of a fool Galenist Francesco Pozzi of Vercelli (Apologia in Anatome pro Galeno, contra Andream Vessalium Bruxellensem, Francisco Puteo Medico Vercellensi Authore 1562). The physician and mathematician, Hieronymus Cardanus first attributed this vindication to a Vesalian source. Cardan is honorably mentioned by Cuneus (p. 70), and in his autobiography, not completed until 1576 (*De vita propria*, Paris, 1643) he testifies unter Testimonia clarorum virorum de me, that Andreas Vesalius in Apologia contra Puteum; sed sub titulo Gabrielis filii Zachariae. The assertion was later popularized by Jacob Douglas and by Boerhaave and Albinus, in their Vesalian bibliographies. Style and orthography, above all, that Cuneus as military surgeon had dissected German and Swiss soldiers favor in his view the authorship of Vesalius. And after Martine had added the apparently important argument that Cuneus's writing, dated Mar. 26, 1563, showed knowledge of the Vesalian reply to the observations of Fallopius, not published until the year 1564, many authors, among whom were Haller, Sprengel and Haeser, unhesitatingly adopted this view.

In the first place I recall that Gabriel Cuneus actually existed, and indeed as Professor of Medicine at Pavia. In 1552 funds were turned over to him to erect an anatomical theatre; in 1554 he was appointed teacher of anatomy, and not until between 1573 and 1574 did Jo. Bapt. Carcanus succeed him. Gabr. Cuneus, together with several other anatomists was mentioned by Franc. Puteus in a manner implying

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that they held the same views as he. In order to clear himself and his colleagues from this charge, Cuneus seized his pen and frankly announced himself as a follower of Vesalius. Cuneus, as teacher of anatomy in Pavia and Mailand may very probably have dissected German and Swiss soldiers. The claim of the similarity of his style and that of Vesalius has no better foundation, and indeed does not allow of closer investigation. But the observation of Martine that Cuneus was familiar with the Vesalian Falloppii Observationum Examen is striking. Indeed Cuneus refers to the latter writing many times (p. 13, 21, 39, 73), and borrows material and even turns of expression therefrom. Since Vesalius, then in Madrid, wrote his answer to Fallopius as early as the end of 1561, more than a year before Cuneus's vindication was written, and both were published by the same house in Venice in 1564, there are various possibilities of a communication before the publication. It is possible that a copy of the manuscript destined for the anatomist Fallopius reached Cuneus from Spain, or that the bookseller, who took the manuscript for publication from Vesalius on his way to Jerusalem, allowed Cuneus to examine it before publishing it. However it may be, Martine's proof can only be regarded as forceful.

Finally, a word as to the author of the now current assertion: Cardanus is vain and not altogether dependable. Vesalius he mentions several times, shows great respect for his accomplishments and sympathy in his fate, he calls him friend, but, as he himself testifies, he did not know him personally, and his reports concerning him are not always exact. The statement regarding Cuneus's book was written

statement regarding Cuviers' book was written concerning him are not always exact. The he did not know him personally, and his reports calls him friend, but, as he himself testifies, compliments and sympathy in his fate. several times, shows great respect for his ac- not altogether dependable. Vesalius he mentions now current assertion: Cardanus is vain and Finally, a word as to the author of the as forceful.

may be, Martine's proof can only be regarded as forceful. examine it before publishing it. However it took the manuscript for publication from Vesal- evs from Spain, or that the bookseller, who is possible that a copy of the manuscript des- of a communication before the publication. It ice in 1564, there are various possibilities both were published by the same house in Ven- before Cuviers' vindication was written, and early as the end of 1561, more than a year in Madrid, wrote his answer to Fallopius as expression therefrom. Since Vesalius, then 73), and borrows material and even turns of the latter writing many times (p. 18, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000).

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The authorship of Vesalius is not only unestablished, but it appears directly improbable on thoroughly examining the publication in question. We do not wish to lay too great stress on the fact that the author draws his anatomy throughout from Vesalius, gives hardly any trace of original observation, and that consequently the anatomy represented here remains vague and is far inferior to that of Vesalius's *Epis. Chyn.* 1546, and also of *Fall. Examen* of 1564. One perhaps might ascribe that to a decline of the creative power of Vesalius. On the other hand I find in the colorless representation of Cuneus several places which in my judgment point directly against the authorship of Vesalius. Among them are as follows:

One cannot understand how, in regard to the drainage outlets of brain secretion, Vesalius follows Leonhard Fuchs and Valverde just as though they had said something better than he. For Vesalius, in the second edition of the *Fabrica* (1555) had fully refuted Fuchs's attempt to save Galen in the matter, and had branded his former friend as plagiarist, and even in the *Falloppius Examen* stamped Valverde as an inexperienced, uneducated, mercenary bookseller. As only Cuneus can write, who really does not entirely renounce Galen and is not able to clearly distinguish between original research and plagiarism.

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V. 8 (and also 1553) the observation of a supernumerary biliary duct opening into the stomach (p. 101). His adversary Fritius considers the case fictitious: Vessalius poses aspicari mentes, nisi fortasse non vidit id quod scripsit. And Cuneus this time is far from interesting for Vessalius, but, on the contrary, since he and his anatomical friends never made that observation, exposes the matter in an unflattering manner. He says: Fritius is perhaps not wrong here. . . . (Vessalius) etiam portionem illam non vidisse forsitan merito aspicariis. Here, too, Galen hides in the background.


In the matter of cerebral ventricles, where diverging views regarding Galen ought to be made to agree, Cuneus attempts to help by making a change in the text of Vessalius's Fabrica favoring Galen. Once more the Galenist is apparent, and at the same is shown the superficiality of Cuneus's writing.

Cuneus refers to the famous mathematician, Gemma Frisius as living, who nevertheless died May 25, 1555, though to be sure, not according to other statements it was not until 1556 in Louvain. Such a mistake an Italian could indeed make, but not Vessalius, who belonged to the Netherlands until the year 1559, and who used to be a close friend of Reinerus Gemma Frisius.

One can see that the writing of Cuneus cannot be classed among the best sources of a Vesalian biography. It is the product of a contemporary, outwardly a follower of the anatomy of Vessalius, but at heart one who had not forsaken Galen.

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